Millennium Development Authority - Ghana

Monitoring and Evaluation Plan

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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 5th day of August, 2014 between the United States of America, acting through the Millennium Challenge Corporation, a United States Government corporation (MCC), and Ghana, 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 following the MCC M&E Policy, and if it is consistent with the requirements of the Compact and any other relevant supplemental legal documents.

LIST OF ACRONYMS

BA	Beneficiary Analysis
CCR	Compact Completion Report
DFP	Detailed Financial Plan
DQR	Data Quality Review
DSM	Demand Side Management
EC	Energy Commission
ECG	Electricity Company of Ghana
EE	Energy Efficiency
EFOT	ECG Financial and Operational Turnaround
ERR	Economic Rate of Return
EEDSM	Energy Efficiency and Demand Side Management
GDP	Gross Domestic Product
GOG	Government of Ghana
GRIDCo	Ghana Grid Company
IPP	Independent Power Producer
ITT	Indicator Tracking Table
KWh	Kilowatt Hour
LNG	Liquefied Natural Gas
M&E	Monitoring and Evaluation
MCA	Millennium Challenge Account
MCC	Millennium Challenge Corporation
MEE	Market and Economic Enclave
MDA	Ministries, Departments and Agencies
MiDA	Millennium Development Authority
MMDA	Metropolitan, Municipal and District Assemblies
MoP	Ministry of Power
MoPet	Ministry of Petroleum
MSMEs	Micro, Small and Medium Scale Enterprises
MWh	Megawatt Hour
NEDCo	Northern Electricity Distribution Company
NFOT	NEDCo Financial and Operational Turnaround
PIA	Program Implementation Agreement
PGSI	Power Generation Sector Improvement
PMC	Project Management Consultant
PURC	Public Utilities Regulatory Commission
QDRP	Quarterly Disbursement Request Package
RSCB	Regulatory Strengthening and Capacity Building
RCT	Randomized Control Trial
TBD	To be determined
USAID	United States Agency for International Development
USG	United States Government
VRA	Volta River Authority

1. COMPACT AND OBJECTIVE OVERVIEW

1.1 Introduction and Background

The Monitoring and Evaluation (M&E) Plan explains in detail how and what MCC and MiDA (the accountable entity for the MCA-Ghana Program) will (a) monitor to determine whether the Projects are on track to achieve their intended results ("***Monitoring Component***"), and (b) evaluate implementation strategies, provide lessons learned, determine cost effectiveness and estimate the impact of Compact interventions ("***Evaluation Component***"). The M&E Plan summarizes all indicators that must be reported to MCC on a regular basis, as well as a description of any complementary data to be collected for evaluation of the Program. The M&E Plan also includes the monitoring and evaluation ("***M&E***") requirements that MiDA must meet in order to receive Disbursements, and serves as a communication tool so that MiDA staff and other stakeholders clearly understand the objectives and targets that MiDA is responsible for achieving.

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, 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 implementers, MiDA management, stakeholders, and MCC to whether or not the program is achieving its major milestones during program implementation and provides a basis for making program adjustments.
- *Describes the evaluation plan*. Explains in detail how MCC and MiDA 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.

1.2 Problem Analysis: The Power Constraint in Ghana's Economy

The Ghana Power Sector

The institutions operating in Ghana's power sector and their respective functions are summarized in the table below. With the exception of the IPPs, all the companies on the electricity value chain are state-owned.

Ghana Power Sector Institutions and their Functions

Institution	Function
Ministry of Power (MoP)	Energy policy formulation
Energy Commission (EC)	Energy policy advisory, planning, technical regulation and monitoring
Public Utilities Regulatory Commission (PURC)	Electricity tariff regulation
Volta River Authority (VRA)	Electricity generation
Bui Power Authority (BPA)	Electricity generation
Ghana Grid Company (GRIDCo)	Electricity transmission
Electricity Company of Ghana (ECG)	Electricity distribution in Southern Ghana
Northern Electricity Distribution Company (NEDCo)	Electricity distribution in Northern Ghana
Independent Power Producers (IPPs)	Electricity Generation

Power as a Constraint

Ghana was selected as eligible to develop this Compact prior to completion of the First Compact. At roughly the same time it was named eligible to develop this Compact, Ghana was also named one of four countries to participate in the pilot for the Partnership for Growth ("Partnership for Growth"), an initiative intended to create the next generation of emerging markets through better coordinated and strategically focused United States Government ("USG") programs and resources. Based on an analysis of the obstacles to economic growth ("Constraints Analysis"), conducted jointly by the Government of Ghana (GOG) and the USG, three key constraints to economic growth were identified: insufficient and unreliable power, lack of access to credit, and insecure land use rights. The Government selected the power sector as the area of focus for its proposed second compact while the Partnership for Growth program in Ghana focuses on the power and credit sectors.

In 2012, the then Ministry of Energy estimated that Ghana needed to make a total of $4.7 billion[1] of investments to catch up and/or upgrade the existing power infrastructure. Of this amount, $200-280 million of investment in generation was required annually to cater for load increases[2].

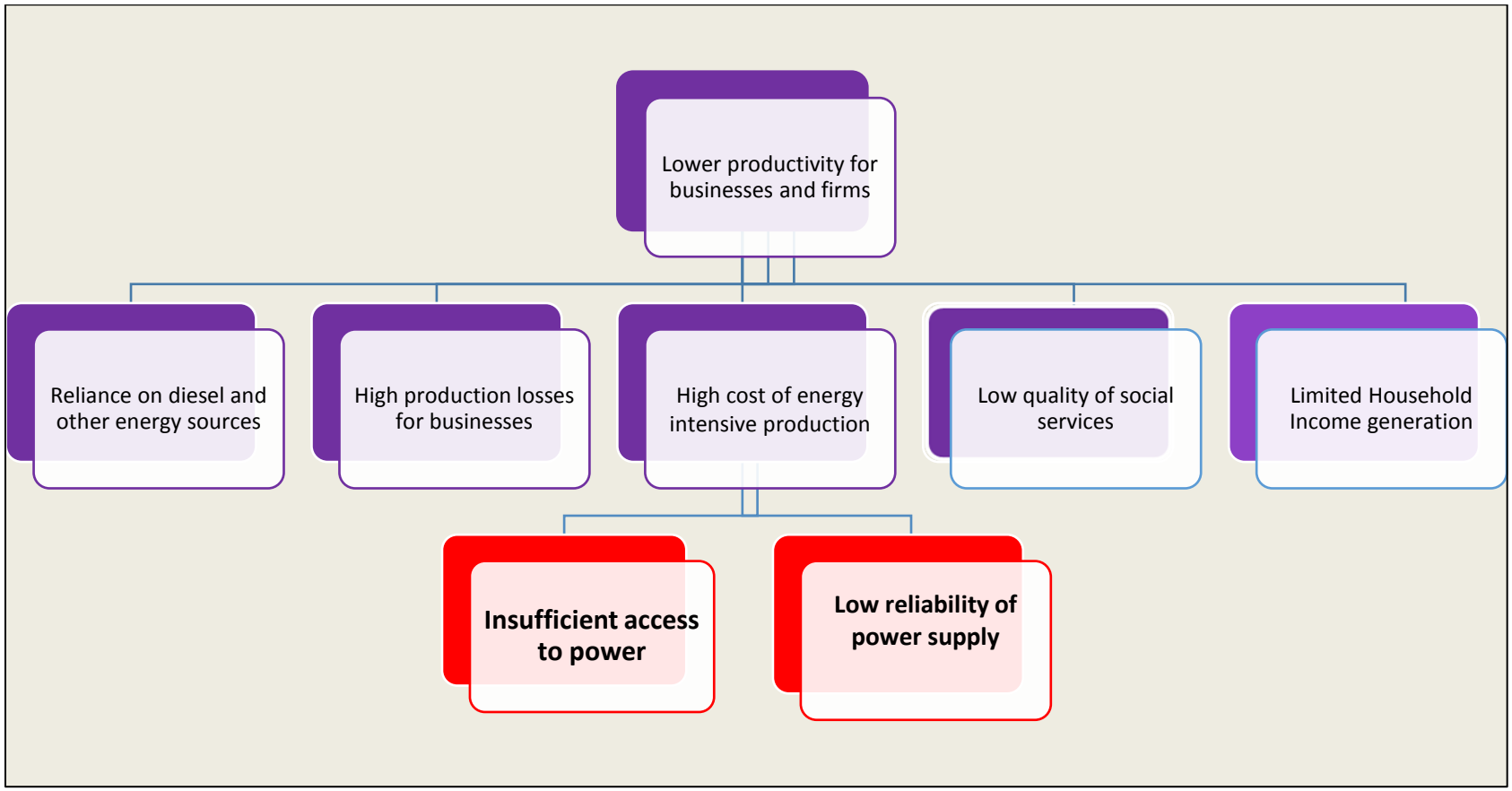
However investment in infrastructure alone will not produce the desired improvement in reliability of electricity supply, without measures to increase the operational efficiency of the operating entities in the power sector, in particular ECG, to increase the creditworthiness of these entities, and thereby attract private capital to the power sector. Using Compact funds to address only the capital and equipment shortfalls of the public sector operators will provide limited opportunities for private sector development and participation in the power sector. However using the Compact funds to undertake the necessary reforms and interventions that would result in opening up the power sector and making it attractive to private capital and investments, will have longer term impact in providing investment opportunities for private capital and investors. Clearly the limited availability of public sector capital for infrastructure development necessitates the adoption of strategies that will attract private capital by leveraging public capital, and creating a conducive environment for private capital to flourish (*Source: MCA-Ghana Concept Paper (Project 1) submitted to MCC*).

The Structure of the Power Problem Tree

The part of the problem tree that identifies power-related issues accounting for lower productivity for businesses and firms is shown in the figure below, which is a subset of the trees developed in March 2012. The full problem tree is in the Annex.

[1] Presentation on 'Investment Opportunities in the Power Sector', Ghana Ministry of Energy, January 2012 (reported in the MCA-Ghana Concept Paper (Project 1) submitted to MCC)
[2] Based on GRIDCo 10-year load forecasts 2011-2021 and Industry Estimates for Costs of Generation (reported in the MCA-Ghana Concept Paper (Project 1) submitted to MCC)

Ghana Power Compact Problem Tree



The Millennium Challenge Account Compact II: The Ghana Power Sector Problem Tree

Low reliability of power and insufficient access to power have been identified as the problems facing the Ghana power sector. The causes of each of these two problems are presented below.

1. Low reliability of power
   1.1 Governance and regulatory framework does not meet the needs of all stakeholders
   1.2 Insufficient power supply to meet economic demand
   1.3 Transmission capacity is constrained
   1.4 Distribution system is constrained and inefficient

1. Insufficient access to power
   1.1. Electrification in rural areas affects balance sheets of Distribution companies negatively
   1.2. Limited government and private investment in rural electrification
   1.3. High cost compared to benefits of rural electrification
   1.4. High costs for off-grid options

The Power Sector Problem Tree was developed by the Ghana Power Compact Development Core Team in consultation with Focal Persons from the power sector agencies, technical advisors, and MCC counterparts. There were also consultations with potential investors, key consumers and the general public.

To make a sustainable impact on reliability and adequacy of electricity supply in Ghana, Compact II seeks to solve the problems that have discouraged private development of generation capacity, as well as addressing the concerns of the power sector agencies and utilities.

The key problems in the area of Governance and Regulation that were identified at the time of developing the Compact are:

- Need for an effective Sector-Specific Legal Framework for IPPs;
- Need for a Full Cost Recovery Tariff;
- Need for increased Transparency of Tariff-Setting Process;
- Absence of Gas Pricing and Allocation Policies and Regulations;
- Distribution Companies not considered Credit Worthy Off-Takers;
- Wholesale Pricing;
- Independence of the Regulatory Bodies;
- Shortfalls in Regulatory Capacities; and
- Insufficient momentum behind the Sector Reform Process.

It is worthy of note that some progress has been made in relation to the identified problems, in particular:

- Need for an effective Sector-Specific Legal Framework for IPPs; and
- Absence of Gas Pricing and Allocation Policies and Regulations.

It is, however, anticipated that there would eventually be full resolution of the identified problems as the identified interventions are implemented.

Adequate and reliable power generation capacity is key in expanding the Ghanaian economy through industrialization and infrastructure development. Addressing the root causes of the inadequate investment in Ghana's power sector generation is expected to serve as the catalyst for a sustainable economic and social transformation.

1.3 Program Logic

1.3.1 Compact Background

On August 5 2014, the Millennium Challenge Corporation (MCC), a Federal Corporation created under Title VI of the Foreign Operations, Export Financing, and Related Programs Appropriations Act, 2004 and acting on behalf of the United States Government (USG), signed a Compact with the Government of Ghana (GOG) worth US$535,565,000 (with the Governments of the United States of America and Ghana contributing US$498,200,000) and US$37,365,000 respectively) to reduce poverty in Ghana through sustainable economic growth[3]. The Ghana Compact which entered into force in September 2016 will be implemented for a five-year period and completed by September 2021. The Government of Ghana has established an agency, identified as the Millennium Development Authority (MiDA), to serve as the Accountable Entity (AE) for the implementation of the Compact.

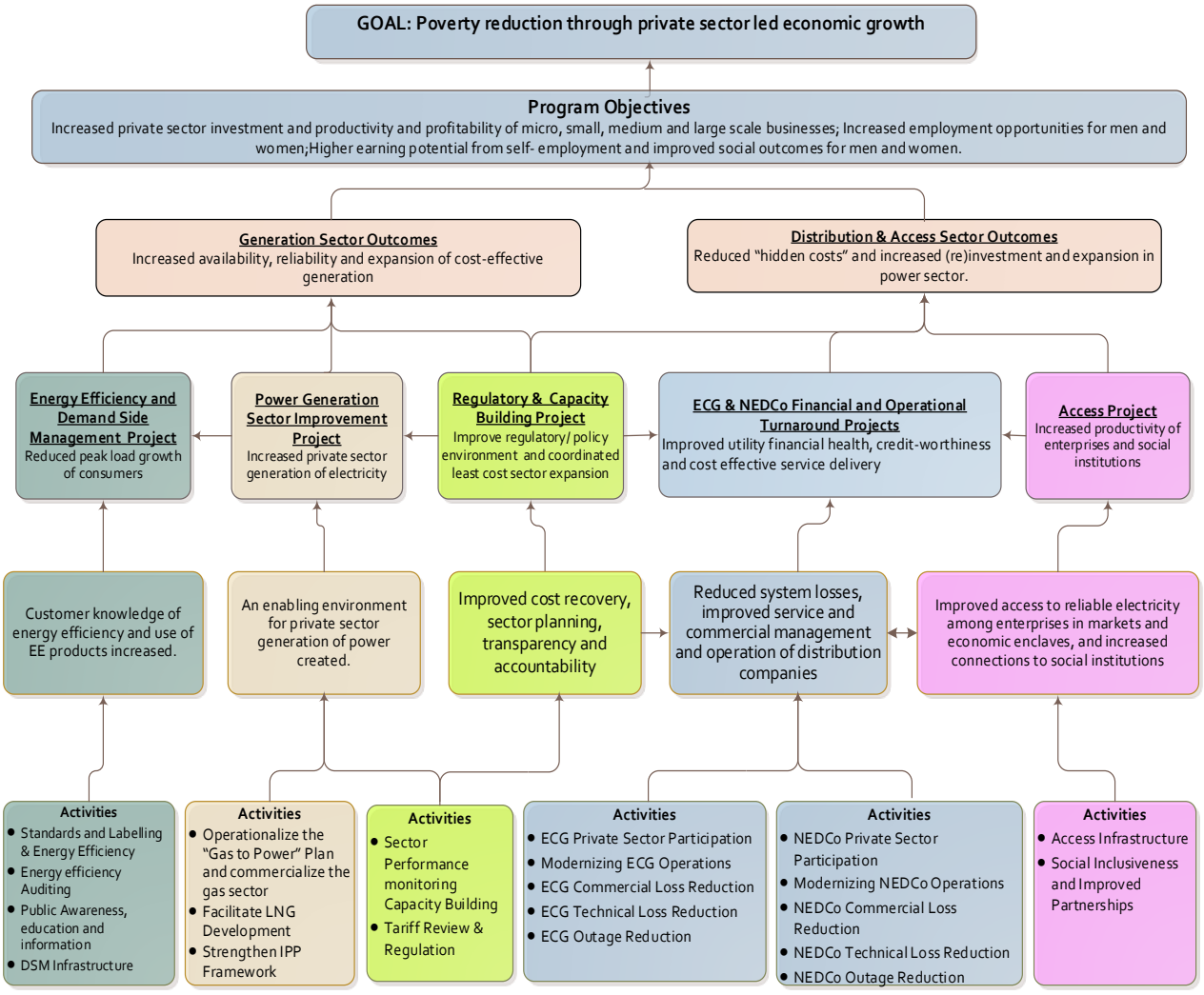
1.3.2 Compact Logic

The Compact-level logic model below illustrates how the Compact Program, Projects and Activities contribute to the Compact Goal, the Program Objectives, and Project Objectives.

The Program Objectives are to: (i) increase private sector investment and the productivity and profitability of micro, small, medium and large scale businesses; (ii) increase employment opportunities for men and women; (iii) raise earning potential from self-employment; and (iv) improve social outcomes for men and women. Prior to the achievement of these high level objectives it is envisaged that a set of hierarchically lower level but interrelated objectives (outcomes) of power generation, distribution and access will be achieved. These outcomes are expected to trigger (cause) the aforementioned program objectives (effects) include (a) increased availability, reliability and expansion of cost-effective generation, and (b) reduced “hidden costs” and increased (re)investment and expansion in the power sector.

[3] Please refer to the Compact Document for a detailed description.

Overall Program Logic



1.3.3 Project Description and Logic

The overall program logic illustrated above is complemented by lower level logic models at the Project, and/or Activity levels (as necessary) depending on Compact design and implementation. All logic models clearly summarize the outputs, outcomes, and goal expected to result from the Program. A description of the objectives of each Project is included below.

The project description and the project-specific logic models, each illustrating its theory of change with the underlying assumptions and risks, are presented below. The logic diagrams are included as annexes to the M&E Plan.

ECG Financial and Operational Turnaround Project Description and Logic

Summary of Project and Activities

The *ECG Financial and Operational Turnaround Project's* objective is to improve the quality and reliability of electricity through reduced outages and cost-effective service delivery by ECG, reduce aggregate technical, commercial and collections losses, and to ensure ECG can serve as a creditworthy and credible off-taker under power purchase agreements. The Project Objective will be achieved by reducing implicit subsidies (created by losses, underpricing and under-billing) and ensuring cost-recovery and re-investment in the distribution sub-sector, through introduction of PSP in the governance and management of ECG, and through infrastructure and foundational investments designed to reduce losses and improve service quality.

There are five Activities under the Project.

Private Sector Participation Activity: This Activity will provide support for the design and execution of an Acceptable ECG PSP Transaction. Funding for this Activity is intended to cover the following interventions:

- Transaction Advisory services to, among others, advise the Government on the design and implementation of an international tender to select an Acceptable ECG PSP Provider, supporting the Government until Financial Close;
- Consultation with management and employees of ECG to gain support for PSP; and
- Consultancy to design the institutional set-up for the Acceptable ECG PSP Transaction.

Modernizing Utility Operations Activity: This Activity is designed to introduce modern tools to ECG, build the capacity of ECG's staff to use the tools, and provide a robust communication network for ECG. Specific interventions include:

- Installation of a Geographic Information System (GIS) based distribution management system, grid digitization, and customer census to record and store basic data;
- Installation of an Enterprise Resource Planning (ERP) system and integration with existing enterprise applications for the purpose of facilitating the flow of information between business functions within ECG and managing connections to outside stakeholders;
- Provision of technical assistance to strengthen Project implementation through the hiring of qualified advisors; upgrade of data center and communications network to assist ECG in creating a data center compatible with current industry standards and to better manage the network;
- Loss characterization study to distinguish between technical and commercial losses in the ECG Target Regions;
- Technical assistance for tariff applications to provide ECG with the support and training needed to develop a rate case filing compliant with the Tariff Plan;
- Institutionalizing gender responsiveness to support gender auditing, development of a gender policy at ECG and support activities for strengthening institutional capacity of ECG

to implement a gender policy and enhance the capacity of female employee associations through knowledge sharing, networking, and the development of internships and mentoring to university students in science and technology, particularly women; and

- Assistance to the ECG training center in Tema in the form of provision of training tools and development/updating of course curricula.

Reduction in Commercial Losses and Improvement of Revenue Collection Rates Activity: The Activity addresses commercial and collection losses. Specific interventions to address commercial losses include:

- Creation of service connection standards and normalization of existing services to update existing standards with a new design; train ECG personnel to enforce the new standards; and repair and upgrade non-conforming services.
- Strengthening the loss control program by providing the loss control units at ECG with the means (training, tools, and equipment) to more effectively reduce commercial losses.
- Installation of automated meter readers at special load tariff service locations and on selected non-special load tariff service locations in the ECG Target Regions as well as installation of metering at critical nodes of the distribution system in the ECG Target Regions to provide ECG the ability to identify and monitor where technical and commercial losses are occurring.
- Replacement of legacy credit meters with pre-payment meters in the ECG Target Regions to improve collection efficiency and timely closing of monthly financial statements.

Technical Loss Reduction Activity: The interventions under this Activity will result in lowering thermal losses for the primary and secondary distribution systems in the ECG Target Regions. Specific interventions include:

- Updated distribution design and construction standards based upon currently accepted best practices to ensure compliance with international best practice for low loss and economical designs.
- Low voltage bifurcation and network improvements to reduce the length of the low voltage circuits to ensure they do not exceed a length that affects the quality of service and a technical loss threshold.
- Introduction of reactive power compensation for primary substations to optimize power levels at 33/11 kV substations.
- Installation of bulk supply points with feeders to existing primary substations to ease overloading based on the current demand forecast and to avoid rolling brownouts.
- Installation of primary substations with interconnecting sub-transmission links and medium voltage offloading circuits to help reduce technical losses and avoid extended outages caused by failures or maximum capacity reached at geographically adjacent substations.

Outage Reduction Activity: The Outage Reduction Activity will improve service and increase sales. The interventions under this Activity include:

- Installation of outage management system to identify outage locations and causes and serve to reduce outage frequencies and durations.
- Sectionalizing study of ECG Target Regions and automation of medium voltage networks and system control and data acquisition expansion to locate sectionalizing devices in the 11 kV network to reduce the geographic area affected by outages.
- Provision of specialized vehicles, tools, and equipment required for fault clearance and restoration of outages in the ECG Target Regions.

Project Logic

Unreliable power has been a major constraint to growth of businesses in Ghana. To effectively support the growth requirements of the economy, key challenges in the distribution of power must be addressed. ECG, the leading Distribution Company in Ghana does not run on commercial basis, incurs high technical and commercial losses, which deters private investment, leads to low quality of service and high cost of electricity service provision.

The EFOT Project is designed to deliver short, medium, and long term goals. In the short term, the Project will improve the financial sustainability of ECG by reducing commercial losses, improving billing and collection, ensuring cost reflective tariffs, regular automatic adjustment of tariffs and improving financial management generally within ECG. Ghanaians are expected to experience improvements in the quality of Power under EFOT through the reduction of unplanned outages and distribution technical losses resulting in an improved voltage profile. Similarly the Operations management of ECG will be transformed by improving outage response time, reducing cost per kWh of electricity generation and reinvestment and maintenance in capital expenditure. Consequently, ECG will regain the ability to adhere to commercially agreed time limits for payments of bills to IPPs. However vital institutional capacity building activities must complement the PSP option to achieve planned improvements in short term outcomes. Also sufficient infrastructure investments including private sector participant contributions are needed to achieve loss reduction targets within ECG.

The medium term outcomes include improving the financial viability of ECG, positioning ECG as a credible off-taker, improving satisfaction among ECG customers and enhanced investment capacity within ECG, resulting in sustainable service delivery. Customers' reliance on diesel and petrol generators will be reduced resulting in the increase in electricity consumption. To achieve the above it is critical that Generation and sector-wide master plan is implemented and key policy and regulations from the Compact are sustainably implemented, ECG's credit guarantee provides assurance to power producers of the Company's worthiness and customers observe improvements in outage response time and frequency of load shedding.

In the long term, among outcomes, Ghanaian businesses will experience an increase in investment coupled with the ability to churn out value added products and reduction in sales losses, which will invariably lead to increased wage employment. It is also expected that, all things being equal, household expenditure on energy will decrease. It must be noted that achievement of results under the EFOT Project depends on coordinated actions from all other Compact program components,

including sector expansion to meet demand. Deterioration in conditions under which businesses operate in Ghana (inflation, interest rates and credit availability, exchange rates) and other factors outside of Compact scope may impact the likelihood of investment and deter private sector investment in Power sector.

The key assumptions and risks that underlie the accomplishment of the theory of change are summarized in the table below. These assumptions and risks are external to the Program[4]

Summary of Key Assumptions and Risks: ECG Financial and Operational Turnaround Project

Project	Assumptions	Risks
ECG Financial and Operational Turnaround Project:	• Sector Government reforms achieved • Customer ability to pay • Payment of bills by GOG • Availability of credit • Customer willingness to pay • Impact can be seen on national level hidden costs • Availability of skilled labor	• Tampering and vandalism of ECG assets • Increased load shedding • ECG staff resistance to change • Political interventions in sector • Consumer resistance to tariff increases

NEDCo Financial and Operational Turnaround Project Description and Logic

Summary of Project and Activities

The *NEDCo Financial and Operational Turnaround Project's* objective is to develop NEDCo into a utility that will contribute to economic growth in the northern part of Ghana by improving its ability to recover costs and provide service to customers in a timely and effective manner. The Project Objective will be achieved by strengthening NEDCo's financial and operational performance and ensuring it is able to function independently, and to engage with the private sector to meet their electricity needs. In addition, this Project will introduce PSP to provide operational and commercial capacity building to ensure the achievement of performance targets, and will provide infrastructure and foundational investments designed to reduce losses and improve service quality. It must be mentioned that the original design of this Project did not meet the acceptable economic rate of return (ERR) and, therefore, it was decided that there was the need to review and redesign the activities envisaged under the Project. This was to ensure that we meet the required ERR threshold for acceptability of the Project. It is therefore expected that there may be a revision of the expected interventions[5]. Future revisions of the M&E Plan shall take into consideration the re-designed NEDCo Project.

The original design of the NEDCo Financial and Operational Turnaround Project consists of the same categories of Activities and many of the same interventions as have been presented above

[4] The M&E Team will document the trends in risk factors for each Project and how their potential impact on the anticipated results. An assumption and risk status tracking table will be developed to help track and explain how these exogenous factors[4] are impacting on Compact results, especially where deviations from the performance targets exceed the ±10 percent deviation from indicator target.

[5] A decision on the re-designed project is not expected until January 2017.

for the ECG Financial and Operational Turnaround Project. However, given the different starting condition and outlook for NEDCo, there are some differences in approach summarized below.

Private Sector Participation Activity: The Private Sector Participation Activity will provide support for the design and execution of an Acceptable NEDCo PSP Transaction. Funding for this Activity is intended to cover the following interventions:

- Transaction advisory services to structure and bring the Acceptable NEDCo PSP Transaction to Financial Close;
- Assistance with targeted communications strategy, outreach and consultation to gain support of stakeholders;
- Consultation with management and employees of NEDCo to gain support for PSP;
- Consultancy to design the institutional set-up for the Acceptable NEDCo PSP Transaction;
- Management contract for the Acceptable NEDCo PSP Provider;
- Formalizing a financial plan, as required pursuant to Schedule 2 of the Program Implementation Agreement (PIA), for a clear and transparent mechanism to cover NEDCo operating losses and capital expenditures; and
- Developing a plan for the separation of NEDCo from the Volta River Authority (VRA).

Modernizing Utility Operations Activity: Similar to the interventions under the corresponding ECG Activity described above, the proposed interventions are as follows:

- Studies for the purpose of identification of strategic extensions of service and other asset improvements to (1) complement specific regional investments in agricultural development financed under the Feed the Future initiative of USAID and other Government and donor support and (2) facilitate growth in local industry, commerce and employment.
- Customer census integrated with GIS based distribution management system and service normalization such that, for those consumers whose meter installations are improperly installed or located, the connection will be normalized to ensure integrity of the services.
- Installation of a customer information system and integration with automated meter reading and prepayment metering system to integrate multiple business applications with which NEDCo will manage its core business functions.
- Providing technical assistance and system monitoring/control to strengthen Project implementation through the hiring of qualified advisors.
- Development of a dedicated data center to store customer service, energy sales, billing, collection, and other mission-critical information and a communication network for NEDCo, compatible with current industry standards to support improvements in network operations.
- Loss characterization study to distinguish between technical and commercial losses in the NEDCo Target Regions.

- Technical assistance for development of rate case to provide NEDCo the support and training needed to develop a rate case compliant with the Tariff Plan.
- Institutionalizing gender responsiveness to support gender auditing, development of gender policy at NEDCo and support activities for strengthening institutional capacity of NEDCo to implement a gender policy and enhance the capacity of female employee associations through knowledge sharing, networking, and the development of internships and mentoring to university students in science and technology, particularly women.

Reduction in Commercial Losses and Improvement of Revenue Collection Rates Activity: Proposed interventions for the Reduction in Commercial Losses and Improvement of Revenue Collection Rates Activity reflect the different needs of NEDCo as compared to those for ECG described above and include:

- Automated meter reading loss reduction project and installation of meters at critical nodes to provide NEDCo with the ability to identify and monitor where technical and commercial losses are occurring.
- Provision of service materials for new connections to facilitate timely and standardized connection of customers.
- Provision of operations and maintenance materials to allow NEDCo to perform emergency and routine repairs and maintenance on distribution feeders, laterals, distribution transformers and services.
- Provision of vehicles, tools, and equipment for operating staff to safely and adequately manage operating functions throughout NEDCo.
- Construction and upgrade of customer service centers to support NEDCo operating functions such as meter reading, bill delivery, collections, receiving and addressing customer complaints, and maintenance activities, all managed through local customer service centers.

Technical Loss Reduction Activity: The proposed investments under the Technical Loss Reduction Activity, similar to those for ECG described above, are:

- Update distribution design and construction standards to reflect best practice.
- Low voltage bifurcation and network improvements to reduce the length of the low voltage circuits to ensure they do not exceed a length that affects the quality of service and a technical loss threshold.
- Introduction of reactive power compensation for primary substations to optimize power levels at 34.5/11 kV substations.
- Rehabilitation/upgrade of lines and underground cables to replace aging medium voltage underground conductors subject to frequent faults that are causing outages.
- Conversion of shield wire scheme to convert the single-phase shield wire distribution service to three phase 34.5 kV distribution on wood or steel poles and energize communities in the NEDCo Target Regions.

- Installation of primary substations with interconnecting sub-transmission links and medium voltage offloading circuits conforming to NEDCo's standard substation design.

Outage Reduction Activity: The proposed investments under the Outage Reduction Activity, are similar although on a more limited scale than those described above for ECG, include:

- Installation of an outage management system to identify outage locations and causes and serve to reduce outage frequencies and durations.
- Sectionalization study of NEDCo Target Regions for the purpose of locating sectionalizing devices in the medium voltage network and implementing the recommendations in a pilot area to reduce the geographic area affected by outages when they do occur.

Project Logic

Reliable and low-cost electricity supply is an essential input for economic activity and to attract productive investment. Conversely, high electricity costs and electricity shortages act as disincentive to investment, hamper competitiveness, and complicate efforts aimed at poverty reduction, all in all resulting in reduced efficiency and a bottleneck to economic activity. Inadequate management of the electricity sector usually brings about electricity rationing and costly subsidies, which are often exacerbated by fraud and nonpayment, or by weak enforcement. Investment in infrastructure alone will not produce the desired improvement in reliability of electricity supply, without measures to increase the operational efficiency of NEDCo operations, to increase the creditworthiness of this entity, and thereby attract private capital to the power sector. Using Compact funds to address only the capital and equipment shortfalls of the public sector operators will provide limited opportunities for private sector development and participation in the power sector.

To help address this challenge, the NFOT project is designed to address key challenge identified within the NEDCo operations. The Project Objective will be achieved by strengthening NEDCo's financial and operational performance and ensuring it is able to function independently, and to engage with the private sector to meet their electricity needs.

The modernization of NEDCo operations would mend NEDCo's network systems which will in turn lead to reduction of commercial loss in the short term. In the medium term, it is envisaged that, the improved financial viability of NEDCo would attract investment in NEDCo operations. Construction and upgrade of customer service centers to support NEDCo operating functions such as meter reading, bill delivery, collections, receiving and addressing customer complaints, and maintenance activities is expected to reduce commercial losses and improve the revenue collection rate.

In the short term, the timely payment of bills to IPPs will create sustainable expansion of the electricity sector to meet demand resulting in reduced load shedding and outages. In addition, it is also expected that the interventions would improve the revenue available for NEDCo's operations.

In the medium term, the provision of service materials for new connections would facilitate timely and standardized connection of customers which will in turn increase their satisfaction. The installation of primary substations with interconnecting sub-transmission links and medium voltage offloading circuits would help reduce technical losses and avoid extended outages caused by failures or maximum capacity reached at geographically adjacent substations. This will enhance investment capacity resulting in sustainable delivery of services. The installation of an outage management system and provision of specialized vehicles for NEDCo operations is also expected to reduce unplanned outages and faults. This will in turn help reduce customer reliance on diesel/petrol thereby reducing proportion of household expenditure on energy for the same units of appliances.

In the long term, the above-mentioned medium term outcomes are expected to reduce losses in added value in terms of lost income to the owners of businesses (or owner-operators as the case may be for informal activities) and wages because of disruptions.

The key assumptions and risks that underlie the accomplishment of the theory of change summarized in the program logic are summarized in the table below.

Summary of Key Assumptions and Risks; NEDCo Financial and Operational Turnaround Project

Project	Assumptions	Risks
NEDCo Financial and Operational Turnaround Project:	• Sector reforms achieved • Customer ability to pay • Payment of bills • Credit and skilled labor for increased investment • Customer willingness to pay • Impact on hidden costs can be felt nationally • Connection fees affordable	• Tampering and vandalism • Customer resistance to tariff increases • NEDCo staff resistance to change • Increased load shedding • Consumer resistance to tariff increases

Regulatory Strengthening and Capacity Building Project Description and Logic

Summary of Project and Activities

The *Regulatory Strengthening and Capacity Building Project's* objective is to ensure the sustainability of all power sector investments, promote greater transparency and accountability for results in the sector, and enhance evidence-based decision making among sector institutions. This Project will therefore ensure that the power sector is financially self-sustaining and relies less heavily on cross-subsidies among tariff categories or other direct or implicit subsidies from the Government. This Project will support creation of an enabling environment for private investment in the power sector. The Project Objective will be achieved by strengthening independent monitoring of service quality, and improving capacity for ratemaking and other regulatory processes, including the review and restructuring of tariffs to enable the utilities to recover costs.

The Regulatory Strengthening and Capacity Building Project consists of two Activities – capacity building of the sector performance monitoring capabilities to ensure better reporting and tariff review, focused on the process of ratemaking and the structure of tariffs.

Sector Performance Monitoring Capacity Building Activity: The purpose of the Sector Performance Monitoring Capacity Building Activity is to provide capacity building for the Ministry of Power (MoP), Ministry of Petroleum (MoPet), National Development Planning Commission (NDPC), Public Utilities Regulatory Commission (PURC), and Energy Commission (EC) staff to strengthen their capacity for performance monitoring and ensuring service quality. The Regulatory Strengthening and Capacity Building Project will focus on regulatory monitoring and independent verification by MoP, MoPet, PURC and the EC.

This Activity will include the following interventions:

- Capacity and needs assessments with regards to data quality, monitoring systems (data collection, analysis, reporting, quality control, and communications) on key performance metrics identified for the Compact and Partnership for Growth and listed in the Electricity Supply and Distribution (Technical and Operational) Rules (L.I. 1816, 2005).
- Technical assistance in developing and implementing monitoring and reporting systems, including the development or improvement of MIS systems for MoP and/or MoPet.
- Support in strengthening the MoP and/or MoPet performance monitoring unit through a resident advisor in MoP and/or MoPet.
- Provision and training for EC and PURC staff on equipment and processes for proper independent monitoring and verification. This will include support in benchmarking and developing more realistic performance targets for licensed and regulated entities, either government owned or privately owned.
- Data quality audits and training in proper monitoring practices for sector stakeholders, including NDPC.
- Support for the publication and analysis of performance data for the sector, including NDPC, in order to enhance transparency.

Tariff Review and Regulation Activity: The proposed interventions under this Activity, designed to strengthen ratemaking and other regulatory processes, are:

- Facilitating one or more partnership arrangements with qualified organizations comprised of state, national or international regulatory practitioners and technical experts.
- Various studies to include an updated cost of service study (at the levels of generation, transmission, and distribution), cost of unserved energy study, system losses study, willingness/ability to pay study, cross subsidization/lifeline study, quality of service performance index study, multiple dwelling study, and street lighting levy review.

Project Logic

Ghana has embarked on reform of its power sector driven by the need for new investment in the sector, optimized power utility performance, and increased security of supply. However, these reforms have focused on implementing isolated reform elements - instead of focusing and striving to build a solid, coherent and sustainable reform agenda. Difficulties in sustaining reforms, and the lack of appropriate legal and regulatory mechanisms have led to low levels of investment and inefficient sector performance in Ghana.

While there are different models for power sector reform (each with its own advantages and disadvantages) a number of broad international best practices can be distilled to form the building blocks of a robust and sustainable power sector. There is therefore the need to take account of Ghana's national institutional environment, and the overall investment climate.

In the long run, it is expected that, an improved tariff model and processes that meet requirements of all sector stakeholders in terms of both cost recovery and an effective and efficient lifeline mechanism would be achieve. This will in turn lead to sustainable expansion of the electricity sector to meet the growing demand. This is premised on the assumption that Generation and sector-wide master plan will be implemented and key policy/regulations supported by Compact will also be sustainably implemented. It is also envisaged that the Sector Performance Monitoring Capacity Building Activity will enhance human and technical capacities for carrying out regulatory mandates, including tariff setting and power quality monitoring.

The key assumptions and risks that underlie the accomplishment of the theory of change are summarized in the table below. These assumptions and risks are external to the Project.

Summary of Key Assumptions and Risks: Regulatory Strengthening and Capacity Building Project

Project	Assumptions	Risks
Regulatory Strengthening and Capacity Building Project	• Continuous GoG support for reforms • Financial re-structuring can be done in 5 years • Generation and Sector wide Master Plan is implemented • Key policy/regulations will be sustained	• Tampering and vandalism of equipment • Stakeholder resistance to changes • Delays in reforms due to political backlash • Customer resistance to tariff increases • Increased load shedding

Access Project Description and Logic

Summary of Project and Activities

The objective of the *Access Project* is to demonstrate how access[6] to reliable electricity can be improved among Micro, Small and Medium Enterprises (MSMEs) in select Markets and Economic Enclaves (MEEs) in urban and peri-urban areas coinciding with those regions targeted by the commercial and technical loss reduction investments of the ECG and NEDCo Financial and Operational Turnaround Projects. The Access Project is expected to increase the number of new connections in selected areas by identifying and reducing barriers to obtaining legal connections and reliable supply, thereby contributing to increased productivity of enterprises in the selected markets and economic enclaves. This Project will also contribute to the overall objective of the distribution turnaround projects of reducing commercial losses and improving the financial health of the distribution companies, by decreasing the number of consumers who would otherwise seek illegal connections to the network.

The Access Project is expected to provide public lighting in Markets and Economic Enclaves, increase the number of new connections for MSMEs in targeted areas by reducing barriers to obtaining legal connections and strengthening partnerships among relevant institutions, thereby contributing to improved socially inclusive service delivery and increased productivity in Markets and Economic Enclaves. In addition, this Project may facilitate connections to social institutions (schools and health facilities) within the area of the Markets and Economic Enclaves.

The Project in currently in the design stage, with consultants currently on the field to propose intervention sites for approval by MiDA and MCC. The next revision of the M&E Plan will be based on the approved project design.

There are two Activities under the Project.

Improved Electricity Supply to MSMEs and Social Institutions Activity: The objective of this Activity is to improve the supply of electricity for MSMEs in Targeted Markets and Economic Enclaves and, to the extent possible, nearby social institutions. To inform the design of this Activity, a power audit will be conducted in the Targeted Markets and Economic Enclaves and nearby social institutions to provide information on the status of existing electricity infrastructure; wiring standards; and potential fire hazards and recommend upgrades and corrective interventions to ensure reliability in electricity supply and safety. The interventions envisaged under this Activity are as follows:

[6] Access to electricity will be assessed along several dimensions including (1) capacity, (2) duration/availability, (3) reliability, (4) quality, (5) affordability, (6) legality, (7) convenience, and (8) health and safety.

- Infrastructure upgrades and corrective actions in Targeted Markets and Economic Enclaves to provide safe and legal connections and power supply, and to reduce fire hazards.
- Provision of metered Public Lighting in Targeted Markets and Economic Enclaves and Targeted Social Institutions to extend business operating hours, prevent theft and increase public safety, in particular for women.
- Electrification of Targeted Social Institutions that currently lack service. The above interventions will be carried out in coordination with the Energy Efficiency and Demand Side Management Project.

Improving Service Delivery and Strengthening Partnerships Activity: The objective of this Activity is to develop and implement technical and institutional approaches for broadening participation in the productive use of electricity that can be applied in the service areas of ECG and NEDCo. The interventions under this Activity are as follows:

- Conduct studies to better understand the various challenges. MSMEs in Targeted Markets and Economic Enclaves experience in obtaining access to legal and reliable electricity. The studies will examine (1) standards and requirements for connection, (2) ECG and NEDCo's institutional challenges in serving markets and economic enclaves, (3) customer perceptions of connection processes, (4) cost of connection, and (5) any other relevant barriers identified. Based on the outcome of these studies, design and implement solutions to address the various barriers MSMEs face in gaining legal and safe access to electricity. The implementation of the solutions will be scaled, organized and executed to allow robust impact evaluations where feasible.
- Conduct a study on the challenges MSMEs in Targeted Markets and Economic Enclaves face in using electricity for productive purposes, as well as the programs and services that are currently available to address those challenges. Based on the findings of the study, implement information outreach campaigns and other selected potential interventions recommended by the study to create opportunities for MSMEs to benefit from relevant programs and resources.
- Conduct an assessment of relevant institutions (market women associations, trade associations, Ministries, Departments and Agencies (MDAs), ECG and NEDCo) to identify the challenges in the relationships between utilities and end users of electricity and recommend interventions to improve coordination and partnerships and thereby outreach to and awareness among the stakeholders.
- Based on the outcome of the above assessment, design and implement interventions to (1) enhance the relevant institutions' capacity for coordination; and (2) strengthen partnerships for improving service delivery and promotion of safe practices of use of electricity.

Project Logic

Lack of access to reliable and quality electricity can be a major constraint on economic growth and improved living standards. In Markets and Economic Enclaves (MEEs) in Ghana, the supply is subject to frequent service interruptions and voltage fluctuations. Also, illegal electricity

connection is common in these MEEs because of operators' perception of cumbersome processes for electricity service connection, compounded by faulty and overaged wiring which sometimes result in fire outbreaks that lead to high property loss and safety risks to the operators and the public at large, most of whom are women. Poor lighting in MEEs also exacerbates safety risks levels causing operators to curtail their operating hours before dusk, hence limiting incomes. Worldwide experience shows that a well-functioning power sector is essential for rapid economic growth and improvements in the quality of life of the people of any country.

In markets and economic enclaves found in both urban and peri-urban areas in Ghana, there are clusters of MSMEs engaged in the production of goods and provision of services. These MSMEs are the source of employment for the majority of Ghanaians because only 16% of employment is generated in the formal sector (equally split between formal private sector and public sector jobs), according to the Ghana Statistical Services. Hence the Compact activities and sub-activities under the Access Project outlined above will go a long way to trigger short, medium to long term outcomes and reduce poverty levels for both men and women, as described in the theory of change in the subsequent paragraphs.

With the Access Project intent to provide MEEs, schools and hospitals (within close proximity, i.e. 100-meter radius) safe, reliable and legal connection to electricity, and install public lighting, operators in MEEs are expected to extend their operating hours, experience added value on existing products/services, create new products/services, and reduce property/equipment damage as well as improve safety of property and people in the short term. This outcome will be realized on the assumption that management of the MEEs will put in place adequate safety and security measures and that, the implementation of information, education and communication (IEC) intervention will cause behavioral change among operators and that the benefits outweigh cost .

As operators in MEEs extend their operating hours, experience added value on existing products/services, create new products/services, and reduce property/equipment damage as well as improve safety of property and people, MSMEs in MEEs will experience increase in productivity, reduction in cost of doing business and increased sales of goods and services in the medium term.

The social inclusiveness and improved partnership activity is expected to produce outputs like reduced bottlenecks in getting connected, easy access to electric power through the streamlining of ECG and NEDCo connection processes, and improved compliance with wiring standards. In the short term these outputs will increase the number of operators pursuing legal connections and legal consumption of electric power and hence reduce theft of same. In addition, MSMEs in the MEEs will also make cost savings from reduced use of higher cost energy sources. These short term outcomes are premised on behavioral changes among operators as a result of the IEC interventions. In the medium term the increase in the number of MSMEs in the MEEs pursuing legal connections and legal consumption of electric power and reduction in power theft will reduce commercial and collection losses to the utilities. Within the same timeframe it is expected that investment and expansion among the MSMEs will increase.

In the long term, the aforementioned medium term outcomes are expected to cause MSMEs to increase employment and the wage bill, and increased profits in the MEEs.

The key assumptions and risks that underlie the accomplishment of the theory of change are summarized in the table below. These assumptions and risks are external to the Project.

Summary of Key Assumptions and Risks: Access Project (Selected Markets)

Project	Assumptions	Risks
Access Project	• Easy identification of customers • Customer ability and willingness to pay • (Consumer expenditures?) • Clear targeting criteria, including pro-poor considerations • Credit availability • Connection fees affordable • Labor availability • Appliance availability	• Tampering and vandalism • Customer resistance to tariff increases • Social acceptance of projects • Increased load shedding • Land ownership and availability • Low poverty levels

Power Generation Sector Improvement Project Description and Logic

Project Description

The objective of the *Power Generation Sector Improvement Project* is to reduce disruptions in electricity service due to generation shortfalls by promoting timely investments in additional installed generation capacity, through the creation of an improved enabling environment for private sector investment in conventional and renewable generation. This Project aims to ensure a more cost-effective fuel mix by instituting a framework for a reliable fuel supply for thermal generation. In addition, this Project will facilitate the adoption of a least-cost expansion plan leading to increased potential throughput to electricity consumers and reduced energy costs to enterprises, households and industry. It was originally anticipated that the Project would achieve these results by establishing a competitive tendering process for IPPs, by helping to finalize commercial gas supply agreements to facilitate development of gas reserves and LNG for power generation, and by securitizing the gas sector to enable reduced reliance on more costly oil-based fuels.

There are likely to be changes in the activities to be covered under the Compact, following from on-going discussions between MiDA, MCC, USAID, MoP and other stakeholders. This has become necessary because USAID has commenced implementation of some of the activities planned under the Project. The next revision of the M&E Plan will take into consideration the changes to the scope.

The original design of the Power Generation Sector Improvement Project comprised three Activities, which are described below.

The *Operationalize the "Gas to Power" Value Chain Activity* is to provide essential technical assistance to the Government to establish a sustainable, market-oriented gas sector in Ghana so

that gas can serve as the principal fuel source to meet the growing demand for electricity at least cost. Specific interventions to accomplish this objective include:

- Embedded advisory support in the form of strategic advisors to lead the process of gas sector structuring and policy determination and serve as managers of short-term capacity building activities.
- Capacity building to develop work products arising from the Gas Action Plan and Gas Sector Master Plan that have been prepared by MoPet, each with attendant training to Ghanaian stakeholders.

The *Facilitate Liquefied Natural Gas (LNG) Development Activity* is intended to position the Government to secure LNG supply in the short to medium term to support the diversification of fuel for power generation. This Activity will provide technical assistance in the form of advisory support and capacity building to complement the technical engineering feasibility and design studies that have already been funded by MCC prior to Compact implementation. The intent is to provide the Government with the appropriate financial and technical analyses required to attract funding from the private sector or other donors for LNG development. Specific interventions include:

- LNG financial feasibility study to better understand the requirements for achieving Financial Close for an LNG project in Ghana.
- LNG sourcing and pricing study to deepen and update the understanding of potential sources of LNG and forecast of prices over a long-term period.
- Analysis of LNG transaction structures to develop options for Ghana.

The objective of the *Strengthen Sector Planning and IPP Framework Activity* is to strengthen Ghana's power generation sector by providing a methodology to obtain new generation capacity at the lowest cost to meet the growing demand for electricity and expressed commitment to obtain future generation plants through private sector investment. Interventions under this Activity include:

- Developing a least-cost integrated resource plan (IRP), installing an IRP system in Ghana, and providing associated capacity building for personnel in the energy sector. The IRP is a comprehensive plan for meeting forecasted annual peak energy demand (plus some established reserve margin) through a combination of supply-side and demand-side interventions over a specified period. This will allow the Government to conduct more effective strategic planning for the electricity grid and off grid systems and provide generation capacity from both traditional and renewable sources. The IRP will include a time-bound implementation plan which will make the plans for and the timing of the expansion of the power grid and additional generation capacity more transparent for stakeholders.
- Developing a set of standard forms of contract for IPPs – such as agreements for power purchase, government support, escrow, and fuel supply.
- Designing and providing core documents for IPP procurement processes (the IPP Solicitation Plan). The private sector promotion activities will cover both on-grid and off-grid options and will address the enabling environment for renewables. With respect to off-grid options, the Activity will examine market barriers to entry, recommend ways to strengthen opportunities for off-grid solutions, and design outreach approaches.
- Providing strategic advisors to lead the process of sector planning, oversee the IRP development, and serve as transaction advisors on the first competitive IPP transaction(s), which will include renewable energy sources.

Project Logic

The key component to economic growth in power generation is adequate and reliable power generation capacity. To ensure that there is adequate installed generation capacity to meet the growing demand of electricity supply in Ghana, the power generation sector improvement projects will seek to address issues related to inadequate and unreliable gas supply, lack of a gas sector master plan and credible off taker, uncoordinated capital expansion, as well as an unclear IPP framework.

It is expected that the short and medium term outcomes and goal would be achieved if the project is able to successfully contribute to the establishment of a sustainable, market-oriented gas sector to meet the growing demand for electricity at least cost. The availability of thermal plant will improve, this will lead to reduction in cost per kWh of electricity generation, which will eventually reduce the energy expenditure borne by consumers.

In addition, the Facilitation of LNG Development Activity will support the diversification of fuel for power generation. The outcome is that, new generation of power will be committed and appropriate licenses issued and, thereby, leading to reduction in load shedding and outages and thus enhancing business investment.

The Strengthen Sector Planning and IPP Framework Activity will contribute to the provision of a more sustainable and cost-effective fuel mix for thermal plants. This will lead to lower cost per kWh of electricity generation which will eventually reduce the energy expenditure borne by consumers.

In the long run, with additional investment in generation at least cost, the whole economy will benefit – by reducing power outages, enhancing the sustainability of increased thermal generation and increasing the potential throughput to beneficiary electricity consumers by enabling base load production from gas. The Power Generation Sector Improvement Project will reduce energy cost to enterprises, households and industry, improve general economic productivity and support the preservation and creation of employment opportunities in the economy.

The Power Generation Sector Improvement Project will also benefit the independent power producers, as the stable fuel supply (competitively priced gas), clearly defined process, and regulatory certainty will lead to lower generation costs per kWh with a more predictable return on investment; investors in gas exploration and production, due to clear, rational and commercial arrangements in the sector; and developers of renewable energy projects by lowering barriers to entry, creating clear contracting processes and transparent pricing.

The key assumptions and risks that underlie the accomplishment of the theory of change summarized in the program logic for the Power Generation Sector Improvement Project are shown in the table below.

Summary of Key Assumptions and Risks: Power Generation Sector Improvement Project

Project	Assumptions	Risks
Power Generation Sector Improvement Project	• Cost-reflective tariff regime in place • Non-MCC Investments are attracted • Credible off-taker in place • Availability of Gas for power generation	• Land availability • Volatility of global fuel prices • Delays in reforms • Increased load shedding

Energy Efficiency and Demand Side Management Project Description and Logic

Summary of Project and Activities

The *Constraints Analysis* documents that the demand for electricity is outstripping supply in Ghana, which creates a gap in power availability and also undermines the reliability of the system. Energy efficiency and demand side management represent cost-effective opportunities to bridge this gap, serving, in effect, as sources of supply.

The objective of the *Energy Efficiency and Demand Side Management Project* is to reduce electricity demand through improved building and appliance efficiency, to reduce peak load on the network, and to sustain improvements in energy efficiency through the development of technical capacity for energy audits as well as public outreach and education. Improved efficiency will in turn make the same amount of electricity generated available to more consumers, and at a lower cost than by developing additional generation capacity. It will also help in moving towards the creation of a reserve margin, in terms of generation capacity relative to peak demand. Interventions like the adoption and enforcement of standards and labels for priority equipment (i.e., items factoring into peak demand), coupled with the installation of test facilities for energy efficient appliances will help reduce peak load while also reducing the energy consumption and therefore costs customers incur with the use of these appliances. In addition, because government agencies account for a significant portion of electricity demand in Ghana, the Project will improve the financial viability of ECG and NEDCo by reducing the demand from government facilities via efficiency retrofits. Installation and/or replacement of streetlights with LED technology will reduce the lighting load and by extension the evening peak load. Finally, this Project will achieve and sustain these results by establishing training centers to train energy auditors to conduct regular audits of public buildings, by developing and disseminating education tools to be incorporated at educational institutions, and by conducting public outreach on energy efficiency.

The Energy Efficiency and Demand Side Management Project is organized into four Activities, each described below.

Development and Enforcement of Standards and Labels Activity: Energy efficiency standards and labelling will be developed to provide information on the energy efficiency performance of selected energy consuming appliances and products available on the market, and to ensure minimum efficiency standards for products on the market. In addition, the standards and labelling that do exist could benefit greatly from technical updates and enforcement support. The uptake of more efficient appliances and equipment will reduce consumer utility bills and thereby save them

money in the long run. It could also help reduce peak demand, or at least mitigate growth in peak demand.

Improved Energy Auditing Activity: Capacity building for energy auditing will be provided to energy management professionals to ensure that a core of qualified and certified professionals are available in the Ghanaian market who can assist industrial and commercial customers in implementing cost effective energy savings measures such as building retrofits. The capacity building will be complemented by investments in training centers and mobile test labs. This Activity also includes demonstration audits to stimulate the market and strengthen energy service companies that will effectively promote energy efficiency retrofits in industrial, institutional, and Government facilities.

Education and Public Information Activity: Public education and information activities help ensure that consumers are fully informed regarding the benefits and trade-offs of higher efficiency appliances and equipment. This Activity potentially includes direct public education interventions targeting high energy peak load consumers and developing an energy efficiency component to integrate into the school curricula.

Demand Side Management Infrastructure Activity: This Activity will support the conversion of conventional street lights in ECG Target Regions to highly efficient LED street lights.

Project Logic

The expected output from the four EEDSM Project interventions include increased public education, information and awareness about performance and benefits of energy efficient equipment and measures through advertising campaigns, outreach to educational institutions, importers and retailers of electrical appliances, etc. Other outputs are efficiency ratings, labels, and standards for major energy-using equipment established and enforced; legislative instruments for enforcement of standards gazetted; and market monitoring enhanced and product certification process improved. Finally, the EEDSM activities will facilitate national capacity building on energy auditing and management, institutionalize industrial and commercial energy efficiency audits, and expand the training and certification of energy efficiency (EE) auditors. The project will also ensure closer collaboration between energy efficiency auditors and energy efficiency manufacturers.

The increase in public education, information and awareness about performance and benefits of energy efficient equipment and measures is expected to make the public better informed on energy efficiency and empowered to reduce energy consumption in the short term. Within the same timeframe, the standards and labels and enforcement of major energy-using equipment will improve the demand profile and reduce the growth rate. The above-mentioned energy auditing outputs will also cause a further improvement in the demand profile and reduction in the growth rate, especially at peak periods. Again, in the short term, the replacement of lamps of streetlights

with more efficient lamps like LEDs and/or better street lighting technology will also reduce the lighting load of the country, and further shave the peak load.

In the medium term, a more enlightened public on EEDSM will enable the country's generation capacity to transcend meeting demand to ensuring adequate reserve margin. As more private, industrial and government institutions internalize the practice of energy auditing to their buildings, we will experience efficient use of installed capacity and cause reduction of greenhouse gases emission in the medium term. Finally, in the medium term, the reduction in the lighting load will minimize unplanned outages at both transmission and distribution levels, and increase access and consumption of electric power for new customers, thereby reducing customer reliance on diesel generators.

In the long term, the medium term outcomes are expected to contribute in diverse ways to decrease household and business energy basket expenditures and thus business losses, increase value-added production, increase business investments, wage employment and incomes.

The key assumptions and risks that underlie the accomplishment of the theory of change summarized in the program logic are shown in the table below.

Summary of Key Assumptions and Risks: Energy Efficiency and Demand Side Management Project

Project	Assumptions	Risks
Energy Efficiency and Demand Side Management Project	• Training program can be implemented within 5-years • Consumer behavior changes. • Technology affordable and available on the market • Rate of demand growth is 6% annually • Effective enforcement of standards and labels requirements • Willingness and ability of consumers to purchase efficient appliances • Generation and sector-wide master plan implemented and key policy/regulations from Compact sustainably implemented	• Import restrictions due to inflation and fiscal position • Circulation of inefficient household appliances

1.4 Projected Economic Benefits

The ERR analysis calculates average economic opportunity costs of electricity disruptions by estimating losses in value added due to the costs of own generation of electricity and losses of value added due to the temporary cessation of economic activity. The midpoint ERRs for each project are presented in the table below.

Economic Rate of Return Analysis

Project	Current Economic Rate of Return (ERR)	Date Current Economic Rate of Return (ERR) Established
ECG Financial and Operational Turnaround Project	19%	August 2014
NEDCo Financial and Operational Turnaround Project	TBD	TBD
Regulatory Strengthening and Capacity Building Project (costs incorporated in ECG/NEDCo calculations)	Not Applicable (wrapped into the ECG and NEDCo ERRs)	Not Applicable
Access Project	Not Applicable	Not Applicable
Power Generation Sector Improvement Project	24%[7]	August 2014
Energy Efficiency and Demand Side Management Project	27%	August 2014

1.4.1 Economic Analysis of ECG Financial and Operational Turnaround Project[8]

The analysis estimated the benefits of reducing service disruptions attributable to network deficiencies by considering key factors affecting the level of downstream subsystem outages, which vary by substation. If ECG resources for re-investment are limited and therefore focused on routine maintenance and equipment replacement, and spread thinly, then areas with older assets could display higher rates of system failure. Investments in critical equipment replacement (compact-mediated hardware inputs) and higher levels of financial resources applied to system maintenance and re-investment (compact-mediated institutional, 'software' inputs) is expected to lead to downstream incremental benefits.

1.4.2 Economic Analysis of NEDCo Financial and Operational Turnaround Project

The original design did not meet the hurdle ERR of 10 per cent. The Project is currently undergoing re-design.

[7] Refers to full elimination of a deficient reserve margin.
[8] Information presented are extracts from the *Ghana II Economic Assessment: Guide to the Analysis and Work Files*, which was prepared by MCC. This also applies to the sections on the Power Sector Generation Improvement Project and the Energy Efficiency and Demand Side Management Project.

1.4.3 Economic Analysis of Regulatory Strengthening and Capacity Building Project

The beneficiaries are incorporated in the ECG and NEDCo Financial and Operational Turnaround Projects.

1.4.4 Economic Analysis of Access Project

The Access Project is yet to be fully designed, and it does not have to meet any economic threshold as a requirement for funding.

1.4.5 Economic Analysis of Power Generation Sector Improvement Project

The assessment of the benefits of interventions in generation hinges on the likelihood of periodic disruptions because the reserve margin is critically low. Over the years, Ghana's reserve margin has been much closer to zero, compared to the 20% which should ordinarily be the case. Thus, it is not possible to provide back up when power plants have to be shut for maintenance or as a result of other problems. An improved environment for private sector investment has been identified as necessary, in which the operation of a credible, credit-worthy off-taker is a key element, but the existence of infrastructure to facilitate timely expansions of generation capacity is also seen as an important feature of a favorable investment environment. The analysis determined how dependent an improvement of the long-run level of the reserve margin would be upon installing LNG infrastructure with and without the other institutional interventions under the Compact program; the expected change in investor behavior that would have an impact upon upstream outages. Changes in expected levels of reserve margins without and with interventions provided the basis of an economic analysis.

The Project is highly likely to be re-scoped as a result of on-going discussions with USAID, MoP and other stakeholders. There may, therefore, be the need for the analysis to be reviewed.

1.4.6 Economic Analysis of Energy Efficiency and Demand Side Management Project

Changes in the trend in reserve margins due to reductions in expected growth in peak demand were treated in the same way as in the case of the Power Generation Sector Improvement Project. The analysis of EEDSM interventions considered the average of future outcomes in the presence of low and high reserve margins. The energy efficiency interventions realize their economic benefits through the private purchase of appliances over time that conform to standards that have yet to be defined.

1.5 Projected Program Beneficiaries

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

A general overview of the span of program benefits across the population of Ghana, 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*
ECG Financial and Operational Turnaround Project	Consumers of electricity engaged in productive activity in the ECG Target Regions (Accra East and Accra West).	
NEDCo Financial and Operational Turnaround Project	Consumers of electricity engaged in productive activity located mainly in the NEDCo Target Regions	
Regulatory Strengthening and Capacity Building Project (beneficiaries incorporated in ECG/ NEDCo Financial and Operational Turnaround Projects)	The ultimate beneficiaries, will be the customers of ECG and NEDCo	
Access Project	Markets and Economic Enclaves within Ghana	
Power Generation Sector Improvement Project	All electricity consumers in Ghana and the Government	
Energy Efficiency and Demand Side Management Project	All electricity consumers in Ghana	

* To be provided in subsequent revisions of the M&E Plan

1.5.1 Projected Program Beneficiaries

Each Project of the Compact is intended to further poverty reduction through economic growth. The expected beneficiaries, and the estimated numbers for each Project are presented in the table below.

Projected Program Beneficiaries

Project	Program Beneficiary Definition	Est. Number of Beneficiaries	Present Value (PV) of Benefits[9]	Net Present Value (NPV)[10]
ECG Financial and Operational Turnaround Project	Consumers of electricity engaged in productive activity in the ECG Target Regions (Accra East and Accra West) who realize improved standards of living as a result of economic gains generated by the project, either through higher real incomes or through expenditure savings	4.8 million	USD 357.5 million	USD 143.3 million
NEDCo Financial and Operational Turnaround Project	Consumers of electricity engaged in productive activity located mainly in the NEDCo Target Regions who realize improved standards of living as a result of economic gains generated by the project, either through higher real incomes or through expenditure savings	1.4 million	TBD	TBD
Regulatory Strengthening and Capacity Building Project (beneficiaries incorporated in ECG/ NEDCo Financial and Operational Turnaround Projects)	Immediate beneficiaries would be the institutions and staff receiving the technical assistance and capacity building but the ultimate beneficiaries, will be the customers of ECG and NEDCo who realize improved standards of living as a result of economic gains generated by the project, either through higher real incomes or through expenditure savings	N/A	N/A	N/A
Access Project	Operators in Markets and Economic Enclaves within the ECG and NEDCo Target Regions who realize improved standards of living as a result of economic gains generated by the project, either through higher real incomes or through expenditure savings	TBD	TBD	TBD
Power Generation Sector Improvement Project	All electricity consumers in Ghana who realize improved standards of living as a result of economic gains generated by the project, either through higher real incomes or through expenditure savings and the Government	19.6 million	To be provided in the next revision of the M&E Plan	USD 624.7 million
Energy Efficiency and Demand Side Management Project	All electricity consumers in Ghana who realize improved standards of living as a result of economic gains generated by the project, either through higher real incomes or through expenditure savings	19.6 million	To be provided in the next revision of the M&E Plan	USD 95.8 million

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

[10] 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.

1.5.2 Beneficiary Analysis

There is a very high level of overlap (in some cases complete overlap) of beneficiaries of the respective projects.

The primary beneficiaries of the ECG Financial and Operational Turnaround Project are consumers of electricity engaged in productive activity in the ECG Target Regions. These regions generate over 22 percent of the gross domestic product (GDP) of Ghana and represent more than 23 percent of ECG's total customers. The proposed interventions are expected to reduce losses in added value in terms of lost income to the owners of businesses (or owner-operators as the case may be for informal activities) and wages because of service disruptions. All the beneficiaries of the ECG Financial and Operational Turnaround Project are also captured as beneficiaries of the Regulatory Strengthening and Capacity Building, Power Generation Sector Improvement and the Energy Efficiency and Demand Side Management Projects.

The primary beneficiaries of the NEDCo Financial and Operational Turnaround Project are consumers of electricity engaged in productive activity located mainly in the NEDCo Target Regions. The proposed interventions are expected to reduce losses in added value in terms of lost income to the owners of businesses (or owner-operators as the case may be for informal activities) and wages because of service disruptions. The beneficiary analysis will be updated in conjunction with the computation of economic rates of return. All the beneficiaries of the NEDCo Financial and Operational Turnaround Project, just like those of the ECG Financial and Operational Turnaround Project are also captured as beneficiaries of the Regulatory Strengthening and Capacity Building, Power Generation Sector Improvement and the Energy Efficiency and Demand Side Management Projects.

The beneficiaries of the Regulatory Strengthening and Capacity Building Project would be the customers of ECG and NEDCo. In effect, all consumers of electricity in Ghana (and by implication the beneficiaries of the ECG and NEDCo Projects) are beneficiaries of this Project.

The Access Project will target Markets and Economic Enclaves within the ECG and NEDCo Target Regions. While specific sites have not yet been selected, direct beneficiaries of this intervention are MSMEs within the Markets and Economic Enclaves to be selected. Indirect beneficiaries will be social institutions such as schools and health clinics within the vicinity of the Markets and Economic Enclaves. Estimates for the number of beneficiaries of the Project will be established in more depth after the design phase. All the beneficiaries are also affected by the ECG Financial and Operational Turnaround Project

The Power Generation Sector Improvement Project will directly benefit end users and the Government. In the long run, with additional investment in generation at least cost, the whole economy benefits – by reducing power outages, enhancing the sustainability of increased thermal generation and increasing the potential throughput to beneficiary electricity consumers by enabling base load production from gas. The Power Generation Sector Improvement Project will reduce energy cost to enterprises, households and industry, improve general economic productivity and support the preservation and creation of employment opportunities in the economy. The Power Generation Sector Improvement Project will also benefit the following: (i) IPPs- stable fuel supply (competitively priced gas), clearly defined process, and regulatory certainty will lead to lower generation costs per kWh with a more predictable return on investment; (ii) investors in gas

exploration and production due to clear, rational and commercial arrangements in the sector; and (iii) developers of renewable energy projects by lowering barriers to entry, creating clear contracting processes and transparent pricing.

Reducing energy waste will benefit all electricity consumers in Ghana, as it will make more electricity available at a cost far below that of new generation capacity. Individual activities will target retail consumers, industry, and Government agencies:

(i) The Development and Enforcement of Standards and Labels Activity will impact all consumers who use household and other appliances as its implementation occurs at the national level;
(ii) The Improved Energy Auditing Activity is geared toward industrial and commercial customers, but Government agencies may also show interest in participating;
(iii) The Education and Public Information Activity is meant to reach the general public. Target beneficiaries include high energy peak consumers, students and industrial and commercial actors.

All consumers of electricity in Ghana are potential beneficiaries of the Power Generation Sector Improvement Project.

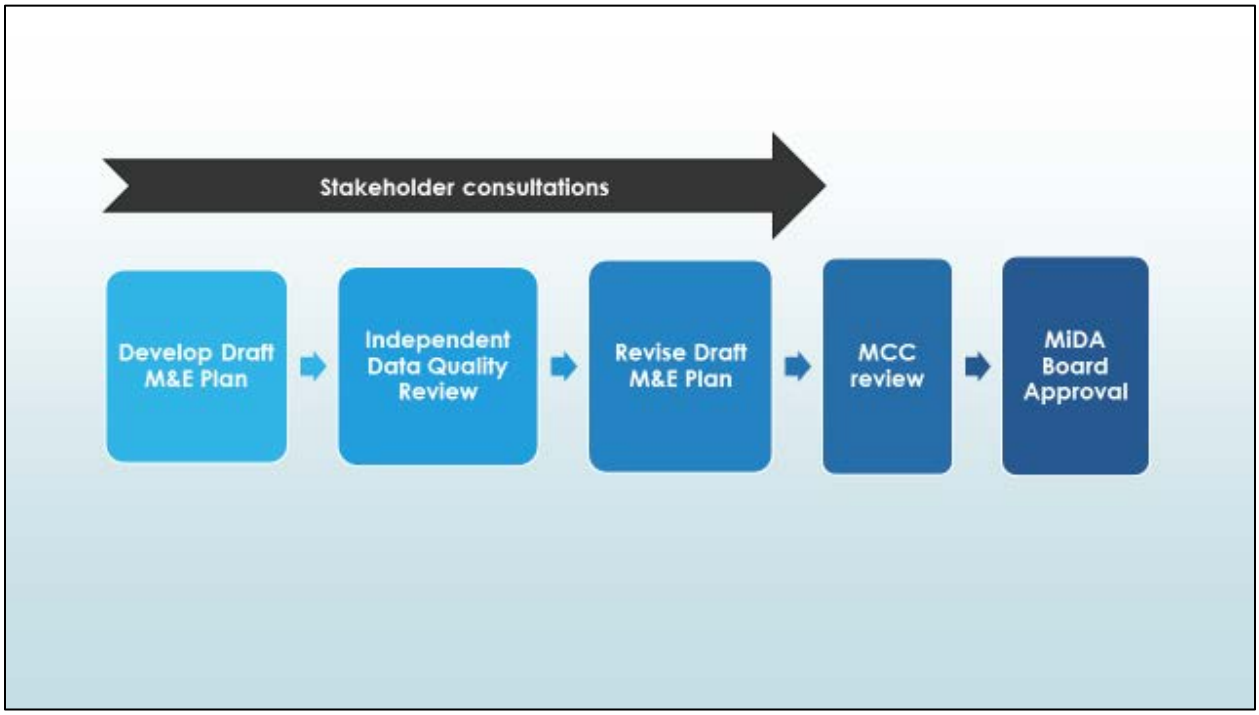
The Demand Side Management Infrastructure Activity will impact a combination of the general public (through LED street lighting) and Government agencies.

1.6 The Process of Developing the M&E Plan

The process of developing the M&E Plan was guided by the MCC M&E Policy and the MCA M&E Plan template, and it was led by MiDA M&E with support and input from MCC M&E. The Plan was developed in conjunction with key stakeholders, including MiDA and MCC Project Teams and Ghana's power sector agencies.

The process is summarized in the chart below. It started with developing the Draft M&E Plan from the description of the Monitoring and Evaluation Plan in the Compact, (also referred to as the Compact M&E Summary), which represents the negotiated legal agreement between the Republic of Ghana (through GOG) and the United States Government (through MCC) on broad M&E issues.

The M&E Plan Process



An independent Data Quality Review (DQR) Consultant carried out an assessment of the Plan, particularly the monitoring indicators that had been proposed, during the period November 2015 - July 2016. The objective of DQR was to assess the quality of data that will be collected for the M&E Plan, and to improve the quality of future data gathering and reporting efforts.

The Consultant reviewed all the Compact outcome indicators, data and data collection methodologies with a view to provide MiDA and the Implementing Entities (IEs) of the Ghana Power Compact with recommendations on how to improve the quality of data used as part of the M&E Plan framework.

The Consultant carried out the following specific activities.

i) Reviewed the relevancy of the Compact indicators used in the draft M&E Plan; and in particular reviewed indicators to ensure their definitions, calculation and measurement methods accurately measure the intended results of the project and project logic;
ii) Ensured the accuracy and quality of data collected to measure and calculate indicators; and
iii) Made recommendations to strengthen the quality of data used in the draft M&E Plan.

The recommendations were used to revise the Draft M&E Plan, including definitions, setting of baselines and targets, and the methodology for measurement.

The revised Draft M&E Plan was then submitted to MCC for informal review by the M&E and Project teams, prior to submission to MiDA Board for approval.

There were stakeholder engagements throughout the process of developing the M&E Plan. These consultations focused on the monitoring component of the plan. Apart from MiDA project teams, and MCC M&E and project teams, key stakeholders in the power sector who were expected to implement Compact activities and/or report on the results were also engaged. These were the service providers (ECG, NEDCo and GRIDCo), technical regulator (EC) and policy maker (MoP)[11].

All of these stakeholders, with the exception of GRIDCo, are also implementing entities for the Compact. Their participation was particularly important since they would be working together with MiDA to implement the Plan.

The roles of stakeholders during each stage of the process are summarized below.

Draft M&E Plan: MiDA M&E and Project Teams initially reviewed the indicators identified in the description of the M&E Plan in the Compact. These were modified to reflect the current state of the Projects. The likely outputs that would inform the setting of targets for indicators were also identified. The power sector stakeholders participated in joint review of proposed indicators with MiDA to finalize the set of indicators, baselines (for outcome indicators) and preliminary targets for outcome and output indicators. MCC worked with MiDA at all the stages of developing the Draft M&E Plan.

Data Quality Review (DQR): The MiDA Project Teams, MCC and power sector agencies provided feedback, through the review of the draft, and participation in a validation workshop on the DQR Report.

Revision of the Draft M&E Plan: In addition to providing feedback on the Draft DQR Report, all the stakeholders participated in target setting exercises with MiDA and MCC.

[11] MiDA has still not had the opportunity of engaging with PURC due to a number of factors. Hopefully, the issues preventing MiDA from fully engaging with PURC would be resolved in the first half of 2017 and their views on the indicators, if any, would be incorporated in the first revision of the M&E Plan.

2. MONITORING COMPONENT

2.1 Summary of Monitoring Strategy

As defined in the MCC M&E Policy, monitoring is the continuous, systematic collection of data on specified indicators to provide indications of progress toward objectives and the achievement of intermediate results along the way. The Compact will be monitored and progress reported regularly through the Indicator Tracking Table (ITT). To monitor progress toward the achievement of results of this Compact, the M&E Plan will identify indicators and establish baselines and targets against which to assess implementation and outcomes. It should be noted that some indicators will continue to be tracked after the Compact Term as necessary.

There are four levels of indicators that follow from the program logic framework: (i) process, (ii) output, (iii) outcome, and (iv) goal. The various indicator levels map to the program logic and thus allow Project developers and managers to understand to what extent planned activities are likely to achieve their intended objectives. Often most outcome (long-term or distal) and goal indicators are not monitored during the life of the Compact, but rather are reported through evaluations after the Compact is complete. Those levels of results typically take longer to be achieved. But intermediate outcomes are monitored during the compact lifecycle.

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 culminating in tangible or intangible outputs, and are directly related through the Program Logic to the output indicators. Output indicators directly measure the deliverables directly from Project Activities. They describe and quantify the "finished" goods and services produced directly by the implementation of an Activity. Process indicators measure progress toward the completion of Project Activities, and at times provide proxy indication of the extent of completion of an output, e.g. "Percent disbursed of power infrastructure construction contracts". They are a precondition for the achievement of Output Indicators and a means to ascertain that the work plan is proceeding on time.[12]

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

The Compact outlines the initial indicators for the Program. The M&E Plan builds on this information with additional indicators developed by MCC, MiDA project managers and implementers in the early stage of project implementation.

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

A number of indicators, baselines and targets are currently pending determination for the NEDCo and Access Projects. The majority of these baselines and targets will be established once the feasibility and design studies are completed. Others are pending updated data that will be available once implementation contracts are awarded and contractors have presented their work plans.

2.1.1 Measurement of Goal, Outcome, Output, and Process Indicators

The results of the Program would be measured using quantitative, objective, and reliable metric (i.e. "indicators"). These indicators may be augmented by qualitative data whenever necessary.

(i) The M&E Plan will establish baselines for every Indicator. An Indicator's Baseline should be established prior to the start of the corresponding Project and/or Activity. Baselines demonstrate that the problem can be specified in measurable terms, and are thus a pre-requisite for adequate intervention design. The Government will collect Baselines on the selected Indicators or verify already collected Baselines where applicable.

(ii) The M&E Plan will establish a target for each Indicator that specifies the expected value and the expected time by which the result will be achieved.

(iii) The M&E Plan will indicate which Indicators will be disaggregated by gender, income level, and age, and beneficiary types to the extent practical and applicable.

(iv) MCC's Common Indicators (as described in the MCC M&E Policy) will also be included as relevant.

(v) Subject to prior written approval from MCC and in accordance with the MCC M&E Policy, MiDA may add Indicators or refine the definitions and Targets of existing Indicators.

(vi) MiDA will report to MCC on monitoring indicators in the M&E Plan on a quarterly basis using an Indicator Tracking Table (ITT) in the form provided by MCC. No changes to Indicators, Baselines or Targets may be made in the ITT until the changes have been approved in the M&E Plan. Additional guidance on Indicator reporting is contained in *MCC's Guidance on Quarterly MCA Disbursement Request and Reporting Package*. In the case that MiDA submits a six-month disbursement request, the ITT must still be submitted quarterly.

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. A more detailed documentation on each indicator to encompass the aforementioned descriptions, rationale and management utility of indicator, plans for data management, data quality assessment, and data analysis would be developed into a Performance Indicator Reference Sheet (PIRS) as Annex IV.

2.1.2 Indicators, Baseline and Year 5 Targets

Key Indicators that can be reported on at least an annual basis will be included in quarterly monitoring indicator reports. Annex I to the M&E Plan (i.e. Indicator Documentation Table) has the list of the Indicators, their definitions, level of disaggregation in reporting, source of data and

the frequency of reporting. Annex II (i.e. Table of Indicator Baselines and Targets) has details of the baseline results, annual targets throughout the Compact period, and the end of Compact targets, for each of the indicators. The Indicators are aligned with monitoring indicators defined in Power Africa and the Partnership for Growth M&E Addendum.

The Compact will be monitored systematically and progress reported quarterly through the ITT.

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

To ensure that the Program is on track to meet its overall goals and objectives, the monitoring indicators will be measured against established baselines and targets, derived from ex-ante economic rate of return analysis, other types of analysis, and project planning documents. The targets reflect the underlying assumptions made in program design about what each activity 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. Justifications for any significant modifications to the indicators or other content will be summarized in Annex III of the M&E Plan.

MiDA M&E Team shall consult and assist implementing entities in setting up their data collection plan and reporting templates.

2.2 Data Quality Reviews

Data Quality Reviews (DQRs) are a mechanism to review and analyze the utility, objectivity, and integrity of performance information. DQRs are to cover: a) quality of data, b) data collection instruments, c) survey sampling methodology, d) data collection procedures, e) data entry, storage and retrieval processes, f) data manipulation and analyses and g) data dissemination.

Data quality is the primary responsibility of MiDA staff, led by the M&E and Economics Director. The M&E Team, other MiDA staff, as appropriate and implementing entities and the Project Management Consultant (PMC) will regularly check data quality. MiDA M&E team will put in place robust quality assurance mechanisms for both routine performance monitoring data as well as periodic survey data, to minimize the likelihood of potential errors generated in the process of sampling, gathering, processing, analyzing and reporting data. The M&E Team will verify that all reported data has appropriate source documentation and that calculations have been done correctly as per the PIRS and other relevant documents like the ITT Guidance issued by MCC. MiDA M&E 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.

In addition to regular data quality checks by MiDA 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 five 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 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.

Data quality reviews are contracted to independent entities in compliance with MCC Program Procurement Guidelines. The ex-ante data quality review was carried out prior to EIF of the Compact. The contract for ex post data quality reviews will be awarded in the early periods of EIF.

The methodology for the reviews will, at the minimum, include a mix of document and record reviews, site visits, and key informant interviews.

The ex-ante review is carried out once, starting before EIF and the results used to finalize the M&E Plan. As indicated in Section 1.6, the ex-ante DQR was undertaken by an independent Consultant to facilitate the preparation of the M&E Plan. It is expected that subsequent data reviews (ex-post) will be undertaken by MiDA staff and any independent Consultants engaged for that purpose.

2.3 Standard Reporting Requirements

2.3.1 Reporting to MCC: Quarterly Disbursement Request Package

Performance reports serve as a vehicle by which the MiDA Management informs MCC of implementation progress and on-going revisions to Project work plans. Currently, MCC requires that MiDA submit a Quarterly Disbursement Request Package (QDRP) each quarter. The QDRP must contain an updated ITT and a Narrative Report, in addition to a Detailed Financial Plan (DFP). 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*.

2.3.2 Reporting to MiDA and Local Stakeholders

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

3. EVALUATION COMPONENT

3.1 Summary of Evaluation Strategy

While good program monitoring is necessary for program management, it is not sufficient for assessing ultimate results. MCC therefore advocates the use of different types of evaluations as complementary tools to better understand the effectiveness of its programs. As defined in the MCC M&E Policy, evaluation is the objective, systematic assessment of a program's design, implementation and results. MCC is committed to making its evaluations as rigorous as warranted in order to understand the causal impacts of its programs on the expected outcomes and to assess cost effectiveness. The Evaluation Component of the M&E Plan contains three types of evaluation activities: (i) independent evaluations (impact and/or performance evaluations); (ii) self-evaluation, and (iii) special studies, each of which is further described in the MCC M&E Policy. The results of all evaluations will be made publicly available in accordance with the MCC M&E Policy.

3.1.1 Independent Evaluations

Every Project must undergo a comprehensive, independent evaluation (impact and/or performance) in accordance with the MCC M&E Policy. However, given the interdependent nature of the Projects for many Compact-wide outcomes, each project may not have its own specific evaluation plan. As appropriate, specific evaluations plans will be developed further and outlined in subsequent versions of the M&E Plan. The Evaluation Component of the M&E Plan describes the purpose of the evaluation, methodology, timeline, required MCC approvals, and the process for collection and analysis of data for each evaluation. All independent evaluations must be designed and implemented by independent, third-party evaluators. If the Government wishes to engage an evaluator, the engagement will be subject to the prior written approval of MCC. Contract terms must be acceptable to MCC and ensure non-biased results and the publication of results.

For each independent evaluation, MiDA is 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.

It is expected that evaluations will focus on three main themes: (i) independent reviews and, as warranted, independent specification and estimation of relevant project ERRs; (ii) assessing household-level impacts of the relevant project investments and activities; and (iii) examining the broad benefits of the PSP on utility organization and management.

Evaluation plans and methodologies for each project have not yet been fully developed. However, MCC and MiDA intend to explore the opportunity to develop impact evaluation designs for all the projects.

3.1.2 Self-Evaluation

Upon completion of the Compact Term, both MCC and MiDA will comprehensively assess three fundamental questions: (i) did the Program meet the Program and Project Objectives; (ii) why did the Program meet or not meet the Program and Project Objectives; and (iii) what lessons can be learned from the implementation experience (both procedural and substantive). MiDA staff will draft the Compact Completion Report (CCR) in the last year of the Compact Term to evaluate these fundamental questions and other aspects of Program performance. Each MiDA department will be responsible for drafting its own section to the CCR for its own activities, subject to cross-departmental review.

3.1.3 Special Studies

The M&E Plan has provision for special studies, *ad hoc* evaluations, and operations research that may be needed to delve deeper for better understanding into emerging implementation issues as part of the monitoring and evaluating of this Compact.

The M&E studies and surveys are to contribute to the evaluation of specific activities/projects, and will not by themselves constitute evaluations. The studies and surveys that have been planned are presented in this section. A final decision on the studies shall be made after the commencement of work by the Independent Evaluator that MCC will procure.

Overall Compact

***Enterprise Survey*:** During Compact development, it was anticipated that The World Bank Enterprise Survey, with its focus on the factors that shape the business environment, would be the source of data for a number of energy related indicators on the enabling environment for business that the Compact seeks to contribute to. The results of the Enterprise Survey are disaggregated for the different firm sizes (small, medium, large), and show the level of specific constraints facing firms. It is now recognized that the frequency and timing of these surveys would not meet the monitoring and evaluation requirements. Therefore, MiDA will hire the services of a survey consultant to conduct enterprise surveys. There will be three rounds of data collection – the first in Year 1 (baseline), the second in Year 3 (mid-term) and the third in Year 5 (end of Compact). Results of studies to be carried on specific projects will also be used for the evaluation of the overall impact.

Distribution Project

Willingness to Pay Survey: Willingness to pay is the maximum amount an individual is willing to sacrifice to procure a good or avoid something undesirable. The price of any goods transaction will thus be any point between a buyer's willingness to pay and a seller's willingness to accept. Thus, this study is intended to find out the willingness of different types of consumers (domestic, commercial and industrial) and scale of industry (small, medium and large) pay for electricity

generated, particularly non-hydro generation which are more expensive. The quantitative approach will be used to enable generalizations about entire populations and sub-groups to be made.

***Customer Survey*:** Customer survey is used to measure how products and services supplied by a company meet or surpass customer expectation. In the specific case of this Compact, the survey shall be used to assess the satisfaction of services provided by the various institutions that the Compact activities are expected to impact improve on their operations or services.

Access Project

***Markets, Enclaves, Schools and Hospitals Access to Power Survey*:** This survey will provide information for economic analytic work in support of decision making about the composition and location of investments within the current scope of the Compact, notably activities related to Access, but also other ECG operations in Greater Accra and the NEDCo operational area.

3.2 Specific Evaluation Plans

The design of NFOT, PGSI and Access Projects are still evolving, while for those that are fully designed or reached an advanced stage in the design (EFOT, EEDSM and RSCB Projects), the evaluation designs are still pending. The presentation here is, therefore, limited to the tentative research questions. The details of the evaluation design for each project will be presented in future revisions of the M&E Plan.

All evaluations shall attempt to answer the following core questions:

1) Were the Compact goal, objectives and outcomes achieved?
2) Why were the Compact goal, objectives and outcomes achieved, or not achieved?
3) What are the unintended (positive or negative) results of the project?
4) What is the cost-effectiveness or re-estimated project rate of return based on realized activity benefits and costs?
5) What is the likelihood that results will be sustained over time?
6) How do the project's benefits and/or costs accrue differently to different groups of beneficiaries, such as a) income group (poor and non-poor), b) location (urban and rural communities), and c) gender (men and women)? What is the reason for these differences?

The focus of Ghana Compact II on energy (specifically power) provides an opportunity to learn about the benefits of investments in the country's energy sector. It is expected that the information produced by Compact evaluations and monitoring will assist GOG and stakeholders in evidence-based planning and policymaking. Given the objectives of both GOG and MCC to foster sustainable economic growth and poverty reduction, the evaluations shall, to the extent feasible, attempt to assess the income benefits of beneficiaries linked to the Compact. To the extent that income cannot be reliably measured, MCC will seek to learn how the projects affect intermediate outcomes necessary for these investments to improve social welfare and promote long-term economic growth. Some of the key intermediate economic benefits streams included in the ERR calculations, and which will drive the evaluations of the Compact, are reduction in energy costs to

consumers. Of particular interest are also variables of expanded investment, firm profits, employment, and increased productivity by firms.

To the greatest extent possible, the Compact analyses will disaggregate results by gender, age, formal / informal sectors and income-quartile. In this way, MCC can assess the program logic and causal linkages underlying the projects.

3.2.1 Summary of Specific Evaluation Plans

3.2.1.1 Overall Program Evaluation Plan

The Program Objectives provide the basis for the evaluation of the overall program impact. The objectives are presented in Section 1.3.2.0

Overall Program Evaluation Questions

Primary Evaluation Questions

1. What is the Program's overall impact on the profitability and productivity of enterprises? What are the mechanisms or channels through which these impacts occur?
2. To what extent do small, medium, and large firms respond to more reliable, accessible, and/or higher quality power by:
    a. Expanding or intensifying production?
    b. Expanding employment?
    c. Investing in expanded plant or other fixed assets and/or different production technologies reliant on electricity?
3. How do small, medium, and large firms respond to higher electricity tariffs? How does the change in tariff affect the profitability and productivity of businesses?

Secondary Evaluation Questions

1. What is the community-level impact of improved power availability and quality? How do project benefits accrue differently to households and/or businesses that are not connected to grid but reside in communities with access to the electricity grid?

3.2.1.2 ECG and NEDCo Financial and Operational Turnaround Projects Evaluation Plan

The evaluation will be on the impacts of investments in infrastructure and reforms, including private sector participation, to improve on the finances and operations. The interventions are expected to improve power supply to customers and reduce outages.

Primary Evaluation Questions

1. Did the infrastructure improvements lead to a reduction in technical losses and improve the quality of power? To what extent can these changes be attributed to the compact investments versus other investments or policy changes by GOG?
2. To what extent did the activities improve the operational efficiency and the cost of distributing power?
3. Did program interventions help increase legal connections and decrease illegal connections?
4. Did the infrastructure improvements result in increased power available to customers, reduce the frequency and duration of outages and load shedding?

Secondary Evaluation Questions

1. To what extent have steps taken improved measures of customer satisfaction?

3.2.1.3 Regulatory Strengthening and Capacity Building Project Evaluation Plan

Following from the project objective of supporting the creation of an enabling environment for private investment in the power sector, the evaluation will be concerned with issues that relate to the extent to which the power sector is financially self-sustaining and less dependent on cross-subsidies among tariff categories or other direct or implicit subsidies from the Government.

Primary Evaluation Questions

1. Did the project reduce "hidden costs" in the sector? To what extent have Compact activities improved operational efficiency and the cost of producing power?
2. Did the project support creation of an enabling environment for private investment?
3. Did the price adjustment of electricity tariffs affect the profitability and productivity of business enterprises?
4. Did the project lead to improved financial position of utilities and quality of service? To what extent did reforms contribute to greater cost savings and efficiency in the production and distribution of power?
5. Did public sector and regulatory reforms improve access to and consumption of power, particularly for the poor? If so, what components of the project – in particular, the lifeline tariff – improved access and / or consumption of power for the poor?
6. To what extent do improvements in PURC independence and regulatory capacity result in improved quality of service and supply by ECG and NEDCo?

Secondary Evaluation Questions

1. To what extent have steps taken under the Compact and by the GOG improved measures of customer satisfaction?
2. Are ECG and NEDCo meeting performance targets set by the shareholder and/or PURC? Why/why not?

3.2.1.4 Access Project Evaluation Plan

The Access Project represents an opportunity to generate evidence on the relative significance of different barriers that MSMEs experience in obtaining a connection to electricity. Moreover, data collected as part of the design and implementation of the project will provide information on the willingness to pay for electricity services among different consumer groups, and the resulting benefits of using electricity for social and productive purposes. Given that there are multiple suspected barriers to access for many markets and small enterprises in obtaining a legal connection, MCC and MiDA will explore the extent to which the design and roll-out of the project can be structured to facilitate a rigorous evaluation design that can test different assumptions about which interventions are most effective in expanding the ability of small enterprises to obtain a safe and legal connection to the grid. For example, depending on the finalization of project activities, MCC and MiDA may assess the feasibility of varying interventions across project sites, including activities to streamline the connection process, install connection points for vendors, assist with certification of wiring, ensure access to the lifeline tariff among eligible customers, or improve the coordination among utilities, markets, and districts in the planning for extension of power infrastructure. Further due diligence is required to better understand the potential costs and feasibility of various evaluation approaches; the goal of the evaluation will be to generate evidence and test assumptions about the most significant barriers to access among impacted groups and to isolate relative effectiveness of interventions to reduce key barriers.

Access Project Evaluation Questions

Primary Evaluation Questions

1. Which interventions are most effective in increasing legal access rates at markets and economic enclaves? Which interventions reduce the number of illegal connections?
2. How does gaining legal access to electricity affect overall energy consumption and the choice of fuel supply for lighting and other purposes at the enterprise level?
3. Which interventions are most effective in increasing the productive uses of electricity for the poor?
4. Does the project result in greater real access/consumptions for the targeted population

Secondary Evaluation Questions

1. How are the benefits distributed amongst different stakeholders?

3.2.1.5 Power Sector Generation Improvement Project Evaluation Plan

The Power Generation Sector Improvement Project is undergoing re-scoping. This is largely because a number of activities proposed under the Compact are being implemented with USAID support. It is still not clear which activities the re-scoped Project will cover. Therefore, it is not possible even to propose evaluation questions.

3.2.1.6 Energy Efficiency and Demand Side Management Project Evaluation Plan

The initial expectation was that the Energy Efficiency and Demand Side Management Project would offer a potential opportunity to integrate rigorous M&E into initial pilots and to use quantitative results to guide the design of the program. However, it is still not clear exactly how the activities will be rolled out. Therefore, it is difficult at this stage to determine whether it would be possible to carry out an impact evaluation, and specific evaluation methodology is yet to be determined.

Demand Side Management and Energy Efficiency Evaluation Questions

Primary Evaluation Questions

1. To what extent do the interventions reduce growth in electricity demand?
2. What was the effect of the public outreach campaign? Did it affect adoption of energy efficiency (EE) and identified inefficiencies/constraints in demand-side management (DSM); what worked/ what did not work?
3. Did the Education campaign have any effects on market barriers/failures and/or energy use?
4. Did the project bring about changes in participant and non-participant usage of Energy Efficient equipment? E.g. on energy and demand savings?

Secondary Evaluation Questions

1. What if any co-benefits of the project were realized (e.g., avoided emissions from clean energy usage, health benefits, job creation, or energy security)?
2. Did the utility bills of non-participants reduce as a result of the project? Did the utilities revenue requirement fall as a result of the project?
3. Did the project have any spill-over effects, such as the creation of audit and/or retrofit enterprises ("ESCOs")? Did participants install additional (not part of the interventions) Energy Efficient equipment? If so, what types and quantities?

3.2.2 Summary of Activities or Sub-Activities without Evaluations

No decision has been taken at this stage on Activities or Sub-Activities that would not be evaluated.

4. IMPLEMENTATION AND MANAGEMENT OF M&E

4.1 Responsibilities

The MiDA M&E Unit will be composed of an M&E and Economics Director who will have the key responsibility of leading and managing all M&E activities; and the Senior M&E Officer and two M&E Officers who will support the M&E and Economics Director in performing the M&E

activities. Additionally, the M&E Unit will hire short-term support on an as needed basis. The M&E Unit will carry out, or hire contractors to complete the following and other related activities:

- Direct implementation of all activities laid out in the M&E Plan and ensure all requirements of the M&E Plan are met by MiDA;
- As the champion of results based management, the M&E Unit will take steps to foster a results oriented culture throughout MiDA and its implementing partners – this includes making sure that M&E information is used by the MiDA 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 MiDA 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,
    - Impact evaluation questions and methodology, etc.;
- Develop and use a documentation system to ensure that key M&E actions, processes and deliverables are systematically recorded. This may be accomplished either as part of the M&E information system or independently. The documentation may encompass the following elements:
    - Indicators and material evidence for reported values
    - M&E Plan versions
    - Reporting manuals and templates
    - Key M&E deliverables including 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)/officers and implement a systematic results dissemination approach that draws on verified ITT data;
- Organize and oversee regular independent data quality reviews 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 and conduct procurement of M&E contracts;
- Ensure that data collection mechanisms are designed to collect data disaggregated by gender and other 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 and Economics Director will be a part of MiDA's internal Management Unit, composed from MiDA leadership, Project Directors, and other Directors. Collaboration with the procurement team will be very important to prepare and conduct timely procurement of M&E related contracts as well as ensuring that other implementation contracts contain necessary data reporting provisions.

Seminars, workshops, elaboration and 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, MiDA M&E Unit should identify a post compact point of contact (POC) for MCC early on in the program and work with that POC to build understanding of the MCC program and monitoring process. This POC should be part of the Government entity that will commit to continuing M&E of Compact investments after the Compact End Date. The M&E Unit should also identify the team that will be responsible for reviewing evaluation reports that are delivered post compact (e.g. project leads), to ensure that the relevant project stakeholders review and provide feedback prior to the publication of final reports.

4.2 MCA Data Management System for Monitoring and Evaluation

MiDA will use the MCC MIS for reporting the QDRP (including the ITT) to MCC.

4.3 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 and Economics Director of MiDA 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 is occurring;
- Checks whether indicator definitions are precise and timely;
- Checks whether M&E indicators accurately reflect program performance;
- Updates indicator targets, as allowed by the MCC M&E Policy; and
- Adds indicators, as needed, to track hitherto unmeasured results.

The M&E Plan will be revised by MCA, 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.

5. M&E BUDGET

The budget for the implementation of the proposed M&E activities for the five-year term of the Compact is US$ USD 7.58 million. The breakdown of the budget allocated for M&E activities is shown in the table below.

M&E Budget (in US Dollars)

Sub-Activities							Total
	CIF Total	Year 1 Total	Year 2 Total	Year 3 Total	Year 4 Total	Year 5 Total	
Planning	450,000	50,000	50,000	200,000	50,000	100,000	900,000
M&E Training	0	170,000	70,000	0	140,000	70,000	450,000
Performance Indicator Monitoring	350,000	0	200,000	0	0	200,000	750,000
M&E Studies and Surveys	700,000	1,350,000	450,000	350,000	450,000	750,000	4,050,000
Midterm and Final Evaluations	0	50,000	300,000	50,000	300,000	50,000	750,000
Communication	0	20,000	20,000	20,000	20,000	20,000	100,000
Miscellaneous	10,000	520,000	10,000	10,000	10,000	20,000	580,000
Total	1,510,000	2,160,000	1,100,000	630,000	970,000	1,210,000	7,580,000

The M&E budget does not include the M&E staff salaries, which are included in the administrative budget of the Compact. The M&E Budget contains cost estimates for all components of the M&E Plan, including planning, M&E training, performance monitoring and data quality reviews, surveys and ad hoc or special studies, annual, mid-term and final evaluations, communicating results, and indicator measurement equipment where relevant. The budget should not exceed the total amount over the five years. However, the distribution of funding between line items and years 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 MiDA from the Compact funds, the evaluation design and analysis is to be funded directly by MCC.

6. OTHER

6.1 Semi-Annual Reviews

The Semi-Annual Review (SAR) process under the Compact is to ensure mutual accountability between MCC and the Government of Ghana. The SAR process will create a platform for MiDA and MCC to jointly supervise, through specific milestones, progress on the implementation of the Government's power sector reform agenda in the following areas: private sector participation in the Electricity Company of Ghana (ECG) and, consequently the reforms in the Company's finances, operations and corporate governance; and private sector participation in the Northern Electricity Distribution Company (NEDCo) and, consequently the reforms in the Company's finances, operations and corporate governance. Other areas are PURC tariff reform; and the overall regulatory enabling environment for public and private sector participation.

6.2 Post Compact M&E Plan

As part of the planning process for winding up the Program at the end of the Compact Term, MCC and MiDA will develop a post-Compact M&E Plan designed to observe the persistence of benefits created under this Compact. This plan will describe future monitoring and evaluation activities, identify the individuals and organizations that will undertake these activities, provide a budget framework for future monitoring and evaluation, and include the funding source for each of the activities specified in the plan. The post-Compact M&E Plan should built directly off the Compact M&E Plan.

ANNEX I: INDICATOR DOCUMENTATION TABLE

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
OVERALL OBJECTIVE											
Objective Level Indicators											
Reduced cost of doing business		Outcome	Percent of firms citing electricity as a major obstacle to doing business	Percentage of firms identifying electricity as a major constraint	Percentage	1. Firm Size (Micro/ small/ medium/large); 2. Gender of Owner (Male/ Female)	Enterprise Survey	Survey Consultant	Other	Will be reported on a biennial basis.	The reduction in the percentage of firms citing electricity as a major obstacle to doing business will provide an indication of the extent to which the business environment has improved.
		Outcome	Sales losses due to power outages	Average value of sales losses due to electricity outages as a percentage of revenue	Percentage	1. Firm Size (Micro/ small/ medium/large); 2. Gender of Owner (Male/ Female)	Enterprise Survey	Survey Consultant	Other	Will be reported on a biennial basis.	To measure alleviation of power constraint to doing business. This is an indicator to measure reduction in losses due to power outages as the availability and quality improves.
		Outcome	Diesel fuel consumption by firms	Average annual kWh of diesel generation consumed by registered firms as a percentage of total kWh of electricity consumed	Percentage	1. Firm Size (Micro/ small/ medium/large); 2. Gender of Owner (Male/ Female)	Enterprise Survey	Survey Consultant	Other	Will be reported on a biennial basis.	This indicator is a proxy for economic, environmental and business impacts. The use of diesel fuel for power generation by firms is an indication of the unreliable supply and quality of power. Reduction in the use will provide an indication of the improved business environment in relation to power availability.
Increased access to reliable electricity		Outcome	ECG Customers	Number of ECG customers connected to the national network	Number	Tariff Class (Residential/ Commercial/ Industrial)	ECG Monthly Commercial Operations Report	ECG	Quarterly		To measure growth in grid connections and household access to electricity in ECG service area. An individual customer is equivalent to a household or firm.
		Outcome	NEDCo Customers	Number of NEDCo customers connected to the national network	Number	Tariff Class (Residential/ Commercial/ Industrial)	NEDCo Operational Report	NEDCo	Quarterly		To measure growth in grid connections and household access to electricity in NEDCo service area. An individual customer is equivalent to a household or firm.
	P-25	Outcome	Percentage of households connected to the national grid	Number of households that have access to a legal connection to	Percentage	Gender of head of HH (male, female), Locality type (rural, urban)	Customer satisfaction survey	Survey Consultant	Annual	Data on this may be collected as part of customer	Measures growth in proportion of households that have access to electricity in the country. This measurement provides an

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
				electricity service from an electrical utility or service provider / Total number of households in the country						satisfaction survey. Awaiting overall Evaluation design to inform the customer satisfaction Survey methodology	indication of the growth in electricity access relative to the growth in population.
ECG FINANCIAL AND OPERATIONAL TURNAROUND PROJECT											
Distribution system losses reduced	P-19	Outcome	Distribution system losses	1 – [Total megawatt hours billed / Total megawatt hours received from transmission]	Percentage	ECG Service Areas (Accra East, Accra West)	ECG Customer Services Division Performanc e Report	ECG	Annual	Non-existence of boundary metering does not allow disaggregation into Accra East and West	Measures improvements or otherwise of ECG's distribution system losses as a result of Compact interventions
		Outcome	Technical losses	[Estimated MWh of power dissipated in electricity system components such as distribution lines, transformers/ Total MWh received from transmission] *100	Percentage	ECG Service Area (Accra East, Accra West)	ECG Customer Services Division Performanc e Report	ECG	Annual	Non-existence of boundary metering does not allow disaggregation into Accra East and West	Measures improvements or otherwise in ECG's technical losses, which constitute a loss of revenue and has direct impact on financial performance
	P-20	Outcome	Commercial losses	Total distribution system losses minus distribution technical losses	Percentage	ECG Service Area (Accra East, Accra West)	ECG Customer Services Division Performanc e Report	ECG	Annual	Non-existence of boundary metering does not allow disaggregation into Accra East and West	Measures improvements or otherwise in ECG's commercial losses, which constitute loss of revenue and has direct impact on financial performance
		Outcome	Percentage of pre-payment customers	Number of customers with pre-payment meters divided by Total number of customers with legacy credit meters and with pre-payment meters in the ECG Target Regions	Percentage	1. Tariff Class (Domestic, Commercial); 2. ECG Service Area (Accra East, Accra West)	ECG Customer Services Division Performanc e Report	ECG	Quarterly		Tracks the percentage of customers with pre-paid meters. Prepaid meters contribute to reducing collection losses and cost of collection, thereby improving ECG's financial health. Prepayment metering system excludes industrial customers

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
Outage response time improved	P-21	Outcome	System Average Interruption Duration Index (SAIDI)	Sum of durations, in customer-hours, of all customer interruptions in a quarter / Total number of customers connected to network in the same quarter.	Hours	ECG Service Area (Accra East, Accra West)	Reliability Indices Report	ECG	Quarterly		Measures the average outage duration for each ECG customer. A reduction in SAIDI indicates improvement in ECG's service delivery and increases in reliability of power
Unplanned outages and faults reduced	P-22	Outcome	System Average Interruption Frequency Index (SAIFI)	Sum of customer-interruptions in a quarter / Total number of customers connected to network in the same quarter.	Rate	ECG Service Area (Accra East, Accra West)	Reliability Indices Report	ECG	Quarterly		Measures the average number of interruptions in electricity supply that each ECG customer experiences. A reduction in SAIFI indicates improvement in ECG's service delivery and increases in reliability of power
Enhanced investment capacity	P-24	Outcome	Operating cost - recovery ratio	Total revenue collected/Total Operating Cost. Total operating cost is defined as operating expenses plus depreciation.	Percentage		Annual Report & Financial Statement	ECG	Annual		Measures the cash flow available for investment
Utility Financial Health Improved		Outcome	Average Collection Period	365 Days * [(Beginning accounts receivables + ending accounts receivable) / 2) / Total sales]	Days		Annual Report & Financial Statement	ECG	Annual		Measures the financial security of ECG and the efficiency of revenue collection
		Outcome	Debt as a percentage of total sales	Total value of accounts receivables over 60 days/Total accounts receivable	Percentage		Annual Report & Financial Statement	ECG	Annual		Measures the financial losses of ECG due to bad debt
	P-23	Outcome	Total electricity sold	The total megawatt hours of electricity sales to all customer types	Megawatt hours	Tariff class (Residential/Commercial/Industrial)	Annual Report & Financial Statement	ECG	Annual		Provides an indication of total megawatt hours of electricity sales to all customer types, which should translate into the gross revenue.
	P-13	Outcome	Maintenance expenditure-asset value ratio	Actual maintenance expenditures / Total value of fixed assets	Percentage		Annual Report & Financial Statement	ECG	Annual		Provides an indication of whether ECG is able to continue providing services at the same level of performance when assets were acquired, and to maximize returns on investments.

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
Timely payments made to sector entities		Outcome	Average payment period to power producers	Duration in days of measurement period * [(Beginning accounts payables to power producers + ending accounts payables to power producers) / 2) / Power purchase cost during measurement period]	Days	Power producer type (public, private)	Annual Report & Financial Statement	ECG	Annual		Gives an indication of the credit worthiness of ECG to the power producers, public and private
		Outcome	Average payment period to Ghana Grid Company	Duration in days of measurement period * [(Beginning accounts payables to GRIDCo + ending accounts payables to GRIDCo) / 2) /Total transmission charge payable to GRIDCO during the measurement period]	Days		Annual Report & Financial Statement	ECG	Annual		Gives an indication of the credit worthiness of ECG to GRIDCO
Modernizing Utility Operations Activity											
Enhanced investment capacity		Output	GIS-based distribution management system in place	Geographic Information System (GIS) based distribution management system, grid digitization, and customer census to record and store basic data for planning purposes in place.	Date	None	GIS Consultant' s Report	Distribution Project Director	Once		The GIS system is required as a base on which other interventions would be rolled out. As such there is the need to monitor its timely deployment to ensure that other planned activities are implemented within the Compact period.

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
		Output	Enterprise Resource Planning System in place	Enterprise Resource Planning (ERP) system and integration with existing enterprise applications for the purpose of facilitating the flow of information within ECG and managing connections to outside stakeholders in place.	Date	None	ERP Consultant's Report	Distribution Project Director	Once		ERP is a foundational investment on which other EFOT interventions would be rolled out. Its timely deployment is necessary to avoid delays in the implementation of the other planned activities.
ECG Technical Loss Reduction Activity											
Technical losses reduced	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 (High, Medium, Low)	EFOT Project Report	Distribution Project Director	Quarterly		Measures the length of distribution lines upgraded to reduce distribution system losses
	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 construction or refurbishment of existing substations supported by MCC.	Megavolt ampere	ECG Service Areas (Accra East, Accra West)	EFOT Project Report	Distribution Project Director	Quarterly		Measures the capacity of distribution substations added before and after Compact implementation
		Output	Number of capacitor banks installed at primary substations/lines	Total number of capacitor banks installed at primary substations/lines for Reactive Power Compensation	Number	ECG Target Region (Accra East, Accra West)	EFOT Project Report	Distribution Project Director	Quarterly		Capacitor banks installed at primary substations will reduce technical losses

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
		Output	Number of Bulk supply points (BSPs)	Number of BSPs installed and commissioned	Number	ECG Service Areas (Accra East, Accra West)	EFOT Project Report	Distribution Project Director	Quarterly		A measure of technical loss reduction. BSPs when installed will improve reliability and quality of power supply
		Output	Number of Interconnecting sub-transmission links	Interconnecting sub-transmission links installed	Number	ECG Service Areas (Accra East, Accra West)	EFOT Project Report	Distribution Project Director	Quarterly		A measure of technical loss reduction and improved levels of reliability in the network
		Output	Number of medium voltage offloading circuits	Total number of medium voltage offloading circuits installed	Number	ECG Service Areas (Accra East, Accra West)	EFOT Project Report	Distribution Project Director	Quarterly		A measure of technical loss reduction. An increase in medium voltage offloading circuits will improve reliability and quality of power supply
ECG Commercial Loss Reduction Activity											
Commercial losses reduced		Output	Number of automated reading meters	Total number of automated reading meters installed at special load tariff (SLT) service locations, selected non-SLT service locations in the ECG target Regions and at critical nodes of the distribution system in the target ECG Regions	Number	Tariff Class (Domestic, Commercial. Industrial); ECG Service Areas (Accra East, Accra West)	Program Records	Distribution Project Director	Quarterly		Tracks the number of automated reading meters installed to provide ECG with the ability to monitor where commercial losses are occurring
Outage Reduction Activity											
		Output	Medium voltage networks automation completed	Date when Medium voltage networks automation is completed	Date	None	Program Records	Distribution Project Director	Once		Tracks when the Medium voltage networks automation is completed. Delays in commissioning this system will impact negatively on efforts aimed at improving reliability and quality of power supply
		Output	Outage management system in place	Date when the system used to identify and resolve outages is commissioned for use	Date	None	Program Records	Distribution Project Director	Once		To track when the outage management system is in place. Delays in commissioning this system will impact negatively on efforts aimed at improving reliability and quality of power supply

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
ECG Financial and Operational Turnaround Project Process Milestones											
Process Milestones Achieved	P-1	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		Procurement Performance Reports	Distribution Project Director	Quarterly		To provide indication of the value of power infrastructure feasibility and design contracts signed under the Compact
	P-2.1	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	Procurement Performance Reports	MiDA Procurement Agent/ Distribution Project Director	Quarterly		To track the value of funds disbursed on power infrastructure contracts, to provide an indication of progress towards completing on target.
	P-2	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	Financial Records	Chief Financial Officer	Quarterly		To track percentage of funds disbursed on power infrastructure contracts, to provide an indication of progress towards completing on target.
	P-3	Process	Value of signed power infrastructure construction contracts	The value of all signed construction contracts for power infrastructure investments using compact funds.	US Dollars	None	Procurement Performance Reports	MiDA Procurement Agent/ Distribution Project Director	Quarterly		To provide indication of the value of power infrastructure feasibility and design contracts signed under the Compact

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
	P-4.1	Process	Value disbursed of power infrastructure construction contracts	The amount disbursed of all signed construction contracts for power infrastructure investments using compact funds.	US Dollars	None	Procurement Performance Reports	MiDA Procurement Agent/ Distribution Project Director	Quarterly		To track value of funds disbursed on power infrastructure contracts, to provide an indication of progress towards completing on target.
	P-4	Process	Percent disbursed of power infrastructure construction contracts	The total amount of all signed construction contracts for power infrastructure investments disbursed divided by the total current value of all signed contracts.	Percentage	None	Financial Records	Chief Financial Officer	Quarterly		To track percentage of funds disbursed on power infrastructure contracts, to provide an indication of progress towards completing on target.
	P-5	Process	Temporary employment generated in power infrastructure projects	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	1. Gender (Male/Female); 2. Labor type (Skilled/ Semi-Skilled/Unskilled); 3. Nationality (Ghanaian/Non-Ghanaian)	PMC Quarterly Report	Distribution Project Director	Quarterly		To track the number of temporary employment generated by energy infrastructure contracts under the Compact
		Process	Contract signed with ECG PSP Provider	Date on which Contract signed with PSP Provider for ECG that is acceptable to both GOG and MCC	Date	None	Program Records	Distribution Project Director	Once		To track the date ECG PSP would be signed; a major milestone for tranche II disbursement

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
NEDCo FINANCIAL AND OPERATIONAL TURNAROUND PROJECT											
Distribution system losses reduced	P-19	Outcome	Distribution system losses	1 – [Total megawatt hours billed / Total megawatt hours received from transmission]	Percentage	NEDCo Service Area (Tamale Station)	NEDCo Commercial Statistics Report	NEDCo	Annual		To measure improvements or otherwise of NEDCo's distribution system losses as a result of Compact interventions
		Outcome	Technical losses	[Estimated MWh of power dissipated in electricity system components such as distribution lines, transformers/ Total MWh received from transmission] *100	Percentage	NEDCo Service Area (Tamale Station)	NEDCo Commercial Statistics Report	NEDCo	Annual		To measure improvements or otherwise of NEDCo's technical losses, which culminates to loss of revenue, with direct impact on financial performance
	P-20	Outcome	Commercial losses	Total distribution system losses (P-19) minus distribution technical losses	Percentage	NEDCo Service Area (Tamale Station)	NEDCo Commercial Statistics Report	NEDCo	Annual		To measure improvements or otherwise of NEDCo's commercial losses, which culminates to loss of revenue, with direct impact on financial performance
		Outcome	Percentage of pre-payment customers	Number of customers with pre-payment meters divided by Total number of customers with legacy credit meters and with pre-payment meters in the NEDCo Target Regions	Percentage	Tariff class (Residential, Commercial, Industrial);	NEDCo Commercial Statistics Report	NEDCo	Quarterly	Prepayment metering system excludes industrial customers	To track the percentage of customers with pre-paid meters. The prepaid meters contributes to reducing collection losses and the cost of collection, thereby improving NEDCo's financial health.
Outage response time improved	P-21	Outcome	System Average Interruption Duration Index (SAIDI)	Sum of durations, in customer-hours, of all customer interruptions in a quarter / Total number of customers connected to network in the same quarter	Hours	NEDCo Service Area (Tamale Station)	NEDCo Reliability Indices Report	NEDCo	Annual		To measure the average outage duration for each NEDCo's customer. A reduction in SAIDI indicates improvement of NEDCo's service delivery and increase sales and vice versa
Unplanned outages and faults reduced	P-22	Outcome	System Average Interruption Frequency Index (SAIFI)	Sum of customer-interruptions in a quarter / Total number of customers connected to network in the same quarter	Rate	NEDCo Service Area (Tamale Station)	NEDCo Reliability Indices Report	NEDCo	Annual		To measure the average number of interruptions in electrify supply that each NEDCo's customers experience. A reduction in SAIFI indicates improvement of NEDCo's service delivery and increase sales and vice versa

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
Enhanced Investment Capacity		Outcome	Ratio of actual maintenance expenditures to planned maintenance budget	Actual maintenance expenditures divided by Planned maintenance budget	Percentage	None	Audited NEDCo Annual Report And Financial Statement	NEDCo	Annual		To provide indication of actual amount spent by NEDCo on maintenance as compared to planned maintenance budget
	P-13		Maintenance expenditure-asset value ratio	Actual maintenance expenditures / Total value of fixed assets	Percentage	None	Audited NEDCo Annual Report And Financial Statement	NEDCo	Annual		To provide an indication of whether or not NEDCo is able to continue providing services at least at the same level of performance when assets were acquired, and to maximize returns on investments.
Utility Financial Health Improved	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	Audited NEDCo Annual Report And Financial Statement	NEDCo	Annual		To measure ratio of NEDCo operating revenue to operating costs.
		Outcome	Average Collection Period	365 Days * [(Beginning accounts receivables + ending accounts receivable) / 2) / Total sales]	Days	None	Audited NEDCo Annual Report And Financial Statement	NEDCo	Annual		Measure of the liquidity or financial security of NEDCo and of the efficiency of revenue collection, specifically the time lag between billing and receiving payment. Average collection period of 40 days represents a good revenue collection.
		Outcome	Debt as percentage of total sales	Total value of accounts receivables over 60 days/Total accounts receivables	Percentage	None	Audited NEDCo Annual Report And Financial Statement	NEDCo	Annual		Measure of NEDCo losses through uncollectable debt.
		Outcome	Average payment period to power producer (VRA)	Duration in days of measurement period* [(Beginning accounts payables to power producers + ending accounts payables to power producers)/ 2) / Power purchase cost	Days	None)	Audited NEDCo Annual Report & Financial Statement	NEDCo	Annual	Currently, NEDCo obtains all its bulk power from VRA. The payment arrangements are not	This was intended to give an indication of the credit worthiness of NEDCo to the power producers. With the non-commercial arrangement, it only gives a measure of the time it takes for VRA to recover payments due from NEDCo.

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
				during measurement period]						commercial terms – VRA takes in all the revenue and pays itself first.	
		Outcome	Average payment period to Ghana Grid Company	Duration in days of measurement period * [(Beginning accounts payables to GRIDCo + ending accounts payables to GRIDCo) / 2) /Total transmission charge payable to GRIDCO during the measurement period]	Days	None	Audited NEDCo Annual Report & Financial Statement	NEDCo	Annual		To give an indication of the credit worthiness of NEDCo to GRIDCO
	P-23	Outcome	Total electricity sold	The total megawatt hours of electricity sales to all customer types	Megawatt hours	Tariff Class (Residential, Commercial, Industrial)	Audited NEDCo Annual Report And Financial Statement	NEDCo	Annual		To provide an indication of total megawatt hours of electricity sales to all customer types, which should translate into the gross revenue.
Distribution system losses reduced	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 High, Medium, Low	NFoT Project Report	NEDCo	Annual		To measure the length of distribution lines upgraded to reduce distribution system losses
	P-11	Output	Distribution substation capacity added	The total added substation capacity, measured in mega volt amperes that is energized, commissioned and accompanied by a test report and supervising engineer's certification resulting from new construction or refurbishment of	Megavolt ampere	NEDCo Service Area (Tamale Station)	NFoT Project Report	NEDCo	Annual		To measure the capacity of distribution substations added by the Compact

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
				existing substations supported by MCC.							
NEDCo Financial and Operational Turnaround Project Process Milestones											
	P-1	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	Procurement Performance Reports	MiDA Procurement Agent/ Distribution Project Director	Quarterly		To provide indication of the value of power infrastructure feasibility and design contracts signed under the Compact
	P-2.1	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	Procurement Performance Reports	MiDA Procurement Agent/ Distribution Project Director	Quarterly		To track the value of funds disbursed on power infrastructure contracts, to provide an indication of progress towards completing on target.
	P-2	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	Financial Report	CFO	Quarterly		To track percentage of funds disbursed on power infrastructure contracts, to provide an indication of progress towards completing on target.

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
Distribution system losses reduced	P-3	Process	Value of signed power infrastructure construction contracts	The value of all signed construction contracts for power infrastructure investments using compact funds.	US Dollars	None	Procurement Performance Reports	MiDA Procurement Agent/ Distribution Project Director	Quarterly		To provide indication of the value of power infrastructure feasibility and design contracts signed under the Compact
	P-4.1	Process	Value disbursed of power infrastructure construction contracts	The amount disbursed of all signed construction contracts for power infrastructure investments using compact funds.	US Dollars	None	Procurement Performance Reports	MiDA Procurement Agent/ Distribution Project Director	Quarterly		To track the value of funds disbursed on power infrastructure contracts, to provide an indication of progress towards completing on target.
	P-4	Process	Percent disbursed of power infrastructure construction contracts	The total amount of all signed construction contracts for power infrastructure investments disbursed divided by the total current value of all signed contracts.	Percentage	None	Financial Records	CFO	Quarterly		To track percentage of funds disbursed on power infrastructure contracts, to provide an indication of progress towards completing on target.
	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	1. Gender (Male/Female); 2. Labour type (Skilled, Semi-Skilled, Unskilled); 3. Nationality (Ghanaian, Non-Ghanaian)	PMC Quarterly Report	Distribution Project Director	Quarterly		To track the number of temporary jobs generated by energy infrastructure contracts under the Compact
REGULATORY STRGTHENING AND CAPACITY BUILDING PROJECT											
Automatic tariff adjustment		Outcome	Tariff adjustment on time	Tariff adjusted on scheduled timeline	Date	None	TBD	PURC	Once	Set baseline and targets after IEA with PURC is signed	Measures ability to revise tariffs and adjust tariff schemes on schedule in order to cover costs with revenues.

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
		Outcome	Tariff adjustment formula applied	Tariff formula is appropriately applied in the Quarter	Number	None	TBD	PURC	Quarterly	Binary indicator – will be reported as 1 or 0. Set baseline and targets after IEA with PURC is signed	Measures ability to revise tariffs and adjust tariff schemes on schedule in order to cover costs with revenues.
Sector Performance Monitoring Capacity Building Activity											
Monitoring capacity of policy, planning and regulatory agencies strengthened		Output	Number of training participants	Number of participants from organizations in the energy sector that participated in training to build their capacity	Number	Gender (Male, Female)	Generation Project Quarterly Reports	Generation Project Director	Quarterly		Measure the number of individuals benefiting directly from the program and allows us to track the inclusion of women in Ghana Power Compact sponsored events.
		Output	Capacity needs assessment	Capacity and needs assessments with regards to data quality, monitoring systems (data collection, analysis, reporting, quality control, and communications) on key performance metrics identified for the Compact and Partnership for Growth for listing in the Electricity Supply and Distribution (Technical and Operational) Rules (L.I. 1816, 2005).	Date	None	Generation Project Quarterly Reports	Generation Project Director	Once		The capacity and needs assessments and its timeliness is important in assessing the success of building the capacity of institutions for Sector Performance Monitoring.
Tariff Review and Regulatory Activity											
Cost-reflective tariff	P-14	Output	Cost-reflective tariff regime	Average Tariff per kilowatt-hour / Long-run marginal cost per kilowatt-hour of electricity supplied to customers	Percentage	None	TBD	PURC	Quarterly	Set baseline and targets after IEA with PURC is signed	Measures utilities' ability to cover expenditures with revenues

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
Cost-reflective tariff		Output	Tariff plan in place	Tariff Plan to guide the setting of tariffs by PURC in place	Date	None	TBD	PURC	Once		This is to track the tariff plan, which forms the basis for the measurement of the timeliness and regularity of tariff adjustment.
ACCESS PROJECT[13]											
Access Project Process Indicators											
	P-1	Process	Value of signed power infrastructure feasibility and design contracts	The value of all signed feasibility, design, and environmental contracts, including resettlement action plans, for power infrastructure investments under the Access Project using 609(g) and compact funds	US Dollars	None	Procurement Performance Report	MiDA Procurement Agent/ Distribution Project Director	Quarterly		To provide an indication of the level of financial commitment made to the MEEs and social institutions in the design and feasibility studies under the Access Project
	P-2.1	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 investment under the Access Project using 609(g) and compact funds.	US Dollars	None	Procurement Performance Reports	MiDA Procurement Agent/ Distribution Project Director	Quarterly		To track the value of funds the Access Project has disbursed in feasibility and design studies.
	P-2	Process	Percent disbursed of power infrastructure feasibility and design contracts	The total amount of all signed feasibility, design, and environmental contracts, including resettlement action plans, for power infrastructure disbursed under the Access Project divided by the total	Percentage	None	MiDA Financial Report	MiDA Fiscal Agent/ Distribution Project Director	Quarterly		To provide an indication of how close the Access Project is to the completion of feasibility and design, and to the commencement of works.

[13] The Access Project design is ongoing, thus Output and Outcome level Indicators would be developed upon full completion of the design. These indicators would be incorporated in the M&E Plan during the next update.

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
				value of all signed contracts.							
	P-3	Process	Value of signed power infrastructure construction contracts	The value of all signed construction contracts for power infrastructure investments under the Access Project using compact funds.	US Dollars	None	Procurement Performance Reports	MiDA Procurement Agent/ Distribution Project Director	Quarterly		To provide indication of the value of power infrastructure construction contracts signed under the Compact
	P-4.1	Process	Value disbursed of power infrastructure construction contracts	The amount disbursed of all signed construction contracts for power infrastructure investments using compact funds.	US Dollars	None	Procurement Performance Reports	MiDA Procurement Agent/ Distribution Project Director	Quarterly		To track the value of funds disbursed on power infrastructure works contracts the Access Project.
	P-4	Process	Percent disbursed of power infrastructure construction contracts	The amount disbursed of all signed construction contracts for power infrastructure investments using compact funds.	US Dollars	None	Procurement Performance Reports	MiDA Procurement Agent/ Distribution Project Director	Quarterly		To track the rate of funds disbursement on power infrastructure contracts under the Access Project and gauge progress towards completion of works prior to delivery of actual project output.
	P-5	Process	Temporary employment generated in Access infrastructure projects	The number of people temporarily employed or contracted by MCA-contracted construction +companies to work on construction of new Access infrastructure or reconstruction, rehabilitation, or upgrading of existing Access infrastructure.	Number	1. Gender (Male, Female); 2. Labor type (Skilled, Semi-Skilled, Unskilled); 3. Nationality (Ghanaian, Non-Ghanaian)	PMC Quarterly Report	Distribution Project Director	Quarterly		To track the number of temporary jobs generated under the Access Project infrastructure contracts
POWER GENERATION SECTOR IMPROVEMENT PROJECT											
Load shedding and outages reduced		Outcome	Total system load shed	Total megawatt-hours shed in a quarter	Megawatt hours	None	Unserved Load Report	GRIDCo	Quarterly		To measure extent and magnitude of generation shortfalls leading to planned outages. The additional investment in generation at least cost will reduce power outages which will result in reduction in load shedding

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
		Outcome	Frequency of load shed	Number of times that load shedding occurred in a quarter	Number	None	Unserved Load Report	GRIDCo	Quarterly		Measures the number of times in a year that load shedding occurred. As the enabling environment is created for IPPs to invest in generation, the amount of power installed plants could improve electricity situation to reduce frequency of load shedding and outages.
		Outcome	Duration of load shed	Total duration in hours of load shed in a quarter	Hours	None	Unserved Load Report	GRIDCo	Quarterly		Measures the total duration in hours of load shed during the quarter. Assumption is that, the amount of power installed plants could improve electricity situation to reduce load shedding and outages.
	P-17	Outcome	Installed generation capacity	Total generation capacity, in megawatts, installed plants can generate within the country	Megawatts	Power generation source (On-grid / Off-grid)	Energy (Supply and Demand) Outlook for Ghana	Energy Commission	Quarterly		Measures the total installed generation capacity, which relates to the Government's goal to have adequate installed generation capacity to meet demand and reserve margin.
		Outcome	Available generation capacity	Total capacity that is actually available for generation	Megawatts	Power generation source (On-grid / Off-grid)	Energy (Supply and Demand) Outlook for Ghana	Energy Commission	Annual		Measures megawatts actually in operation. This provides a better picture of whether or not actual power supply is improving, thus reduction in load shed and outages.
		Outcome	Value of private investment in the energy sector	Absolute value of additional private capital committed for generation infrastructure at Financial Close	US Dollars	None	Ministry of Power (MoP)'s finance investment directorate	MoP/Energy Commission	Once		This indicator measures the amount of financing that enables private sector's response to energy sector opportunities.
		Outcome	IPP Generation committed	Total generation capacity committed by IPPs at Financial Close	Megawatts	None	EC Ghana Wholesale Electricity Market Watch - Monthly Bulletin	Energy Commission	Annual		Measures total generation capacity committed by new IPPs at Financial Close, and provides an indication of progress towards increasing power generation.

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
New IPP generation committed		Outcome	Number of IPPs that achieve financial close	Number of IPPs that have secured financial agreement with financial institutions by satisfying all conditions or received a waiver, requisite documents fully executed, and draw-downs become permissible	Number	None	EC Ghana Wholesale Electricity Market Watch - Monthly Bulletin	Energy Commission	Annual		Measures the number of IPP's that have secured financial agreement with financial institutions by satisfying all conditions or received a waiver, requisite documents fully executed, and draw-downs become permissible
	P-15	Outcome	Total electricity supply	Total electricity, in megawatt hours, produced and/or imported in a year.	Megawatt hours	Domestic/Imports; Independent Power Producer / Government-owned	National Energy Statistics	Energy Commission	Quarterly	It is the sum of gross electricity supplied during the year for all generating stations and imports	This is to gauge the quantity of power available to meet demand
	P-16	Outcome	Power plant availability	Unweighted average across all power plants of the following: total number of hours per quarter that a plant is able and available to produce electricity/Total number of hours in the same month	Percentage	None	Unserved load report	GRIDCO	Quarterly		The objective of measuring availability is to gauge the quality of maintenance being carried out at the plant
Operationalization of the "Gas to Power" Plan and Commercialization of the Gas Sector Activity											
		Output	Number of advisory service days provided	Number of advisory service days provided by MiDA and third-parties under contract on gas sector structuring and policy determination	Number	Type of Organization (Service provider, Regulator)	Generation Project Quarterly Reports	Generation Project Director	Quarterly		Indicator of advisory services to ensure future ability to reform and sustain the gas sector.
		Output	Number of training participants	Number of participants from organizations in the energy sector that participated in training to build their capacity	Number	1. Type of Organization (Service provider, Regulator); 2. Gender of Participant (Male/Female)	Generation Project Quarterly Reports	Generation Project Director	Quarterly		Measure the number of individuals benefiting directly from the program and allows us to track the inclusion of women in Ghana Power Compact II sponsored events.

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
ENERGY EFFICIENCY AND DEMAND SIDE MANAGEMENT											
Increased energy savings		Outcome	Energy savings from upgraded streetlights	Total kilowatt hours of energy saved due to new or upgraded street lighting in ECG Target Regions. Energy saved (kW) = Energy consumption in kW of existing lamps less new lamps over time.	Kilowatt hours	None	EEDSM Project Report	Energy Commission of Ghana	Quarterly	Clamp meters will be used to measure baseline energy use per streetlight, but energy measuring meter box per road segment may be adopted to do the follow up measurements post construction. Computing this indicator requires setting an adjusted energy baseline to provide a reference point.	A key objective of the Project is to reduce energy consumption. The "street lighting" activity will be relying heavily on the use of energy saving street lamps and appropriate infrastructure for adequate illumination. It is expected that the more the replacement of old streetlight infrastructure and lamps with modern infrastructure and energy-efficient lamps like LEDs, the greater the energy savings made.
Increased energy savings		Outcome	Energy savings from "race to retrofit	Total kilowatt hours of energy saved by the participating institutions in "race to retrofit"	Kilowatt hours	Participant /GOG Agency	EEDSM Project Report	Energy Commission of Ghana	Quarterly	Computing this indicator requires setting an adjusted energy baseline to provide a reference point. The savings may be computed from the difference between average monthly energy consumption for the 12 months preceding the baseline and the average monthly consumption for the 12 months after the baseline.	The "race to retrofit/renewables" activity is targeted at eligible public / government facilities where energy efficiency retrofits will be implemented and result in reduced power consumption.

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
		Outcome	Energy savings from standards and labels	Total kilowatt hours of energy saved from the use of energy efficient appliances in place of high energy consuming appliances. Energy saved (kWh) = Energy consumption in kWh of existing appliances less new appliances, as measured by improved energy meters (i.e. data loggers)	Kilowatt hours	None	Household Survey	Survey Consultant	Quarterly	Computing this indicator requires setting an adjusted energy baseline to provide a reference point. Improved energy meters (or data loggers) to be connected to targeted appliances in a sub-sample of sample households in a Household "energy use" survey. A panel study may be adopted.	To track over time the energy saved by the different energy efficient appliances with standards and labels promulgated and enforced.
Demand profile improved and growth rate reduced		Outcome	Percentage of appliances compliant with standards	Percentage of targeted electrical appliances tested at the points of entry that demonstrate compliance with newly promulgated standards	Percentage	Type of appliance (cooling, heating, lighting, motor)	EEDSM Project Report	Energy Commission of Ghana	Quarterly	The measure applies to products that are declared at the points of entry.	A metric to track compliance at the points of entry will provide proxy indication of market penetration of the energy efficient appliances
		Outcome	Number of energy audits	Total number of energy audits conducted by trainees	Number	Type of institution (Public, Private)	EEDSM Project Report	Energy Commission of Ghana	Quarterly		To help track the immediate outcome of the energy audit training
Development and Enforcement of Standards and Labels Activity											
Demand profile improved and growth rate reduced		Output	Number of products with standards developed and passed	Number of products with standards for electrical appliances developed and legislation amended (for the existing standards) or promulgated (for new standards) by Parliament of Ghana to facilitate	Number	None	EEDSM Project Report	Energy Commission of Ghana	Semi-Annual	Under the EE activity legislations on standards and labels for up to 20 energy efficient products, majority of which are electrical appliances	This activity will involve institutions like Energy Commission, Ghana Standards Authority, Attorney General's Department and the Parliament, thus necessary to track to keep an eye on where slippages are bound to occur.

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
				mandatory compliance						would be developed and upgraded.	
		Output	Number of appliance test labs established	Number of appliance test labs constructed and/or test equipment installed and commissioned/ functional	Number	None	EEDSM Project Report	Ghana Standards Authority (GSA)	Quarterly	One "greenfield" test lab for Air-conditioners will be constructed and test facilities installed, but for the other electrical appliances, test facilities would be installed in existing labs at the GSA.	It is imperative to track, over time, how many of the electrical appliances have their test facilities installed and commissioned for operations.
Improved Energy Auditing											
Increased Energy savings		Output	Number of institutions participating in "race to retrofit "	Total number of institutions that benefit from Compact funds to implement the "race to retrofit Program	Number	GOG Agency	EEDSM Project Report	Energy Commission of Ghana	Quarterly	The “Race to retrofit/renewab les” Activity will target MDAs and MMDAs.	The number of institutions in the "race to retrofit" will provide an indication of the commitments of the MMDAs to reduce power consumption, in addition to assessing the likely impact of the activity.
		Output	Number of buildings retrofitted	Total number of buildings with electrical installations and equipment retrofitted in participating institutions	Number	GOG Agency	EEDSM Project Report	Energy Commission of Ghana	Quarterly	The “Race to retrofit/renewab les” Activity will target MDAs and MMDAs.	The number of facilities that undergo retrofits will confirm the level of commitments of the MMDAs to reduce power consumption, in addition to assessing the likely impact of the activity.
		Output	Number of people trained in energy auditing	Number of people trained and certified in energy auditing	Number	Gender (Male/Female)	EEDSM Project Report	Energy Commission of Ghana	Quarterly	Between 2-3 tertiary institutions to deliver the energy auditing trainings	The adequacy of trained and certified local energy auditors is expected to contribute to successful implementation of energy efficiency programs in the country.

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
Education and Public Information											
Increased public information, Education and communication on energy use efficiency		Output	Number of public education campaigns	Number of public education campaigns organized via different media platforms to disseminate information on energy efficiency	Number	Type of media (print, electronic, online)	Project Report	Generation Improvement Project Director	Quarterly	Data to be tracked directly by MiDA	Public education programs on energy use efficiency are expected to incentivize energy consumers to replace high-energy consuming appliances with more energy efficient ones. This activity will complement other EE/DSM activities for purposes of sustainability.
		Output	Number of students reached	Total number of students from pre-tertiary institutions in the pilot using the educational materials / program developed	Number	Gender (Male/Female)	Project Report	National Council for Curriculum Assessment (of the Ghana Education Service)	Annually	Only pilot activity will be monitored. The pilot program presents an opportunity for rigorous evaluation, draw lessons and scale up to the entire country.	Integrating energy efficiency in school curricula is a means of providing formal training to contribute to arousing and sustaining interest in energy efficiency by younger generation.
DSM Infrastructure											
Increased Energy savings		Output	Number of energy saving streetlights	Total number of energy saving bulbs/streetlights installed/constructed	Number	Construction type (lamp only, lamp & pole)	Project Report	Generation Improvement Project Director	Quarterly		One objective of the Project is to reduce energy consumption, and the "street lighting" activity will be relying heavily on the use of energy saving street lamps and appropriate infrastructure for adequate illumination. It is expected that the more the replacement of old streetlight infrastructure and lamps with modern infrastructure and energy-efficient lamps the greater the energy savings.
Energy Efficiency and DSM Project Process Milestones											
Process milestones achieved	P-1	Process	Value of signed power infrastructure feasibility and design contracts	The value of all signed feasibility, design, and environmental impact assessment contracts (consultancies), including resettlement action plans, for power infrastructure	US Dollars	None	Procurement Performance Reports	MiDA Procurement Agent/ Generation Project Director	Quarterly		To provide indication of the value of infrastructure feasibility and design studies contracts signed under the EEDSM Project

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
				investments under EEDSM using 609 (g) and compact funds.							
	P-2.1	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 under EEDSM using 609(g) and compact funds.	US Dollars	None	Financial Records	MiDA Fiscal Agent/ Generation Project Director	Quarterly		To track funds disbursed under the EEDSM infrastructure feasibility and design studies contracts signed.
	P-2	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	Financial Records	MiDA Fiscal Agent/ Generation Project Director	Quarterly		To track rate of funds disbursed and gauge progress towards commencement of works to achieve targeted EEDSM Project outputs
	P-3	Process	Value of signed power infrastructure construction contracts	The value of all signed construction contracts for EEDSM infrastructure investments under EEDSM using compact funds.	US Dollars	None	Procurement Performance Reports	MiDA Procurement Agent/ Generation Project Director	Quarterly		To provide indication of the value of infrastructure construction (works) contracts signed under the EEDSM Project
	P-4.1	Process	Value disbursed of power infrastructure construction contracts	The amount disbursed of all signed construction contracts for power infrastructure investments under EEDSM using compact funds.	US Dollars	None	Procurement Performance Reports	MiDA Procurement Agent/ Generation Project Director	Quarterly		To track funds disbursed under the EEDSM infrastructure construction (works) contract signed.

Result Statement	CI Code	Indicator Level	Indicator Name	Definition	Unit of Measure-ment	Disaggregation	Primary Data Source	Responsible Party	Frequency of Reporting	Additional Information	Rational or Justification for Measurement
	P-4	Process	Percent disbursed of power infrastructure construction contracts	The total amount of all signed construction contracts for power infrastructure investments under EEDSM disbursed divided by the total current value of signed contracts.	Percentage	None	Financial Records	MiDA Fiscal Agent/ Generation Project Director	Quarterly		To provide an indication of progress towards commencement of activities to achieve targeted EEDSM Project outputs
	P-5	Process	Temporary employment generated in power infrastructure projects	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 under EEDSM.	Number	1. Gender (Male, Female); 2. Labor type (Skilled, Semi-Skilled, Unskilled); 3. Nationality (Foreign, Local)	PMC Quarterly Report	Generation Project Director	Quarterly		To track the number of temporary jobs generated under the EEDSM infrastructure contracts

ANNEX II: TABLE OF INDICATOR BASELINES AND TARGETS

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
COMPACT WIDE INDICATORS														
Outcome		Percent of firms citing electricity as a major obstacle to doing business	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Percent of firms citing electricity as a major obstacle to doing business - ***micro***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Percent of firms citing electricity as a major obstacle to doing business - ***small***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Percent of firms citing electricity as a major obstacle to doing business - ***medium***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Percent of firms citing electricity as a major obstacle to doing business - ***large***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Percent of firms citing electricity as a major obstacle to doing business - ***male***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Percent of firms citing electricity as a major obstacle to doing business - ***female***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Outcome		Percent of firms citing electricity as a major obstacle to doing business - ***unspecified***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Sales losses due to power outages	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Sales losses due to power outages – ***micro***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Sales losses due to power outages - ***small***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Sales losses due to power outages – ***medium***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Sales losses due to power outages - ***large***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Sales losses due to power outages - ***male***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Sales losses due to power outages – ***female***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Sales losses due to power outages - ***unspecified***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Outcome		Diesel fuel consumption by firms	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Diesel fuel consumption by firms – ***micro***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Diesel fuel consumption by firms - ***small***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Diesel fuel consumption by firms – ***medium***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Diesel fuel consumption by firms – ***large***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Diesel fuel consumption by firms - ***male***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Diesel fuel consumption by firms – ***female***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets
Outcome		Diesel fuel consumption by firms - ***unspecified***	Percentage	Level	TBD			TBD		TBD	TBD	Yes		Awaiting overall Evaluation design to inform the Enterprise Survey methodology and targets

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Outcome		ECG Customers – Global	Number	Level	2,953,975 (2014)	3,323,708	3,456,850	3,595,336	3,739,387	3,887,481	3,887481	Yes	Based on the AF-Mercados Due Diligence Report base case forecast for ECG Customer numbers for 2017-2021.. Residential projections consist of customer numbers for both lifeline and residential customers	
Outcome		ECG Customers – Residential	Number	Level	2,554,580 (2014)	2,612,598	2,727,962	2,848,226	2,973,599	3,102,548	3,102,548	Yes		
Outcome		ECG Customers – Commercial	Number	Level	397,428 (2014)	707,486	725,173	743,303	761,885	780,933	780,933	Yes		
Outcome		ECG Customers – Industrial	Number	Level	1,967 (2014)	3,624	3,714	3,804	3,902	4,000	4,000	Yes		
Outcome		NEDCo Customers	Number	Level	698,353 (2015)						TBD	Yes		Target to be set after project re-design
Outcome		NEDCo Customers (***Residential)***	Number	Level	567,628 (2015)						TBD	Yes		Target to be set after project re-design
Outcome		NEDCo Customers (***Commercial)***	Number	Level	130,676 (2015)						TBD	Yes		Target to be set after project re-design
Outcome		NEDCo Customers (***Industrial)***	Number	Level	49 (2015)						TBD	Yes		Target to be set after project re-design
Outcome	P-25	Percentage of households connected to the national grid	Percentage	Level	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		Data on this may be collected as part of customer satisfaction survey. Awaiting overall Evaluation design to inform the customer satisfaction Survey methodology and targets
Outcome	P-25	Percentage of households connected to the national grid - ***male***	Percentage	Level	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Outcome	P-25	Percentage of households connected to the national grid - ***female***	Percentage	Level	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		
Outcome	P-25	Percentage of households connected to the national grid - ***rural***	Percentage	Level	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		
Outcome	P-25	Percentage of households connected to the national grid - ***urban***	Percentage	Level	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		
ECG FINANCIAL AND OPERATIONAL TURNAROUND PROJECT														
Outcome	P-19	Distribution system losses	Percentage	Level	22.27 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Non-existence of boundary metering does not allow disaggregation into Accra East and West
Outcome	P-19	Distribution system losses – Accra East &West	Percentage	Level	33.76 (2015)	33.76	32.75	31.44	29.87	27.34	27.34	No	This target is based on the ECG feasibility study report which projected system losses to reduce by 19% over a five year period.	ECG proposes a reduction in system losses from 33.76 in 2015 to 18.35 at the end of the Compact.
Outcome		Technical losses	Percentage	Level	10.55 (2015)	N/A	N/A	N/A	N/A	N/A	N/A	No	This is based on ECG's 2015 technical loss study in which technical losses were estimated at 10.55%. ECG also projects a Technical losses reduction to 8% at the end of the Compact	Non-existence of boundary metering does not allow disaggregation into Accra East and West
Outcome		Technical losses – Accra East & West	Percentage	Level	10.07 (2015)	10.07	9.57	8.90	8.19	7.05	7.05	No	This target is based on the ECG feasibility study report which projected system losses to reduce by 30% over a five year period	
Outcome	P-20	Commercial losses	Percentage	Level	11.72 (2015)	N/A	N/A	N/A	N/A	N/A	N/A	No		

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Outcome	P-20	Commercial losses – Accra East & West	Percentage	Level	23.69 (2015)	23.69	23.18	22.54	21.68	20.29	20.29	No	Targets for commercial losses is the difference obtained when technical losses is subtracted from distribution system losses	Non-existence of boundary metering does not allow disaggregation into Accra East and West
Outcome		Percentage of pre-payment customers – ECG Service Area	Percentage	Level	TBD	TBD	TBD	TBD	TBD	90	90	No		
Outcome		Percentage of pre-payment customers – ECG Residential Tariff Class	Percentage	Level	TBD	TBD	TBD	TBD	TBD	90	90	No		
Outcome		Percentage of pre-payment customers – ECG Commercial Tariff Class	Percentage	Level	TBD	TBD	TBD	TBD	TBD	90	90	No		
Outcome		Percentage of pre-payment customers – Accra East	Percentage	Level	62.29 (2014)	65	70	90	90	90	90	No	The targets are based on ECG's projections from ongoing activities and MIDA's planned interventions	
Outcome		Percentage of pre-payment customers – Accra West	Percentage	Level	89.49 (2014)	90	90	95	95	95	95	No	The targets are based on ECG's projections from ongoing activities and MIDA's planned interventions	
Outcome	P-21	System Average Interruption Duration Index (SAIDI)	Hours	Level	185.48 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	Yes		Awaiting target figures from ECG as the EFOT ERR model assumes no changes in global SAIDI figures for this period

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Outcome	P-21	System Average Interruption Duration Index (SAIDI) – Accra East	Hours	Level	129.16 (2015)	129.16	129.16	116.24	103.33	103.33	103.33	Yes	The ERR model for EFOT assumes a 10% reduction over the baseline in year 3 and a 20% reduction over the baseline in year 4&5. Assumed ECG global as an average of Accra East and West and the rest of ECG. The ERR model assumes no reduction in the rest of ECG	
Outcome	P-21	System Average Interruption Duration Index (SAIDI) – Accra West	Hours	Level	256.25 (2015)	256.25	256.25	230.62	205.00	205.00	205.00	Yes		
Outcome	P-22	System Average Interruption Frequency Index (SAIFI)	Rate	Level	84.54 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	Yes		Awaiting target figures from ECG as the EFOT ERR model assumes no changes in global SAIDI figures for this period
Outcome	P-22	System Average Interruption Frequency Index (SAIFI) – Accra East	Rate	Level	42.09 (2015)	42.09	42.09	37.88	33.67	33.67	33.67	Yes	The ERR model assumes a 10% reduction over the baseline in year 3 and a 20% reduction over the baseline in year 4&5. Assumed ECG global as an average of Accra East and West and rest of ECG. The ERR model assumes no reduction in the rest of ECG.	
Outcome	P-22	System Average Interruption Frequency Index (SAIFI) – Accra West	Rate	Level	104.91 (2015)	104.91	104.91	98.91	93.92	93.92	93.92	Yes		

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Outcome	P-24	Operating cost - recovery ratio	Percentage	Level	81 (2014)	TBD	TBD	TBD	TBD	TBD	TBD	No		Further review of the factors that determine the trends in the variables used in estimating the value is required in order to set realistic targets
Outcome		Average Collection Period	Days	Level	168.71 (2014)	163.27	157.84	125.23	92.00	60.00	60.00	No	In year one ECG will achieve 5% of the target reduction of 60 days..10% reduction in year 2,40% in year 3 and 70% in year 4 and 100% in the year 5	
Outcome		Debt as a percentage of total sales	Percentage	Level	69.07 (2014)	69.07	58.70	41.10	28.80	17.30	17.30	No	The assumption for the target is that Newco will not inherit any of ECG's debts. In addition interventions such as the replacement of legacy meters will improve the way revenue is collected. A 15% reduction per annum is assumed from year 1 to 2. 30% per annum in years 3&4 and 40% reduction in year 5	
Outcome	P-23	Total electricity sold	Megawatt hours	Level	6,346,320 (2014)	7,670,880	8,118,746	8,475,397	8,836,311	9,179, 878	9,179, 878	No	Based on the AF-Mercados Due Diligence Report base case forecast for ECG on Energy sales for 2017-2021	
Outcome	P-23	Total electricity sold- ***Residential***	Megawatt hours	Level	TBD	TBD	TBD	TBD	TBD	TBD		No		Awaiting data from ECG for baseline
Outcome	P-23	Total electricity sold - ***Commercial***	Megawatt hours	Level	TBD	TBD	TBD	TBD	TBD	TBD		No		Awaiting data from ECG for baseline

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Outcome	P-23	Total electricity sold – ***Industrial***	Megawatt hours	Level	TBD	TBD	TBD	TBD	TBD	TBD		No		Awaiting data from ECG for baseline
Outcome	P-13	Maintenance expenditure-asset value ratio	Percentage	Level	1.30 (2014)	1.48	1.62	1.77	1.93	2.10	2.10	No	These targets are based on ECG's own projections. International benchmark is 2.5%	
Outcome		Average payment period to power producers	Days	Level	276.59 (2014)	235.10	188.08	150.46	90.28	45.14	45.14	No	15% of the target reduction (of of approximately 190 days) will be achieved in year 1, 20% in year 2, a further 20% in year 3, 40% in year 4 and 50 in year 5. 45 days is considered an appropriate value based on international benchmarks. This was also a recommendation by the DQR Consultant	
Outcome		Average payment period to power producers – ***Public***	Days	Level	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		Awaiting information from ECG on this
Outcome		Average payment period to power producers – ***Private***	Days	Level	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		Awaiting information from ECG on this
Outcome		Average payment period to Ghana Grid Company	Days	Level	208.53 **(2014)**	187.68	150.14	120.11	84.08	46.24	46.24	No	10% of the target will be achieved in year 1, 20% in year 2, 20% in year 3, 30% in year 4 and 45% in year 5 46 days is considered an appropriate target as the international benchmark is45%. This was also a recommendation by the DQR Consultant	

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Output		GIS-based distribution management system in place	Date	Date	N/A			24- Apr-18			24- Apr-18	No	Date indicated shows when with GIS based distribution management system and service normalization is completed in the EFOT work plan	
Output		Enterprise Resource Planning System in place	Date	Date				20- Feb-20			20- Feb-20	No	Date indicated shows when installation of ERP system will be rolled out	
Output	P-10	Kilometers of distribution lines upgraded or built	Kilometers	Cumulative	0 (2016)	50	2050	4050	6050	6500	6500	No	Target represents the kilometers of distribution lines identified by the ECG feasibility report to be changed to lines upgraded or built	Target figures shown are only indicative
Output	P-10	Kilometers of distribution lines upgraded or built – ***high voltage (33kV)***	Kilometers	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output	P-10	Kilometers of distribution lines upgraded or built – ***medium voltage (11kV)***	Kilometers	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output	P-10	Kilometers of distribution lines upgraded or built – ***low voltage***	Kilometers	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output	P-11	Distribution substation capacity added	Megavolt ampere	Cumulative	0 (2016)	0	750	1500	2250	3000	3000	No	Target represents number of substations identified by the ECG feasibility report to be added to improve the	Target figures shown are only indicative

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
													distribution network under the EFOT Project	
Output	P-11	Distribution substation capacity added – ***Accra East***	Megavolt ampere	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD			
Output	P-11	Distribution substation capacity added – ***Accra West***	Megavolt ampere	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD			
Output		Number of capacitor banks installed at primary substations/lines	Number	Cumulative	0 (2016)				167	167	167	No	Target represents number of capacitor banks installed at primary substations/lines for Reactive Power Compensation	Target figures shown are only indicative
Output		Number of capacitor banks installed at primary substations/lines – ***Accra East***	Number	Cumulative	0 (2016)				TBD		TBD	No	Target represents number of capacitor banks installed at primary substations/lines for Reactive Power Compensation	
Output		Number of capacitor banks installed at primary substations/lines – ***Accra West***	Number	Cumulative	0 (2016)				TBD		TBD	No	Target represents number of capacitor banks installed at primary substations/lines for Reactive Power Compensation	
Output		Number of Bulk supply points (BSPs)	Number	Cumulative	0 (2016)				2	2	2	No	Target represents number of BSPs to be installed to improve voltage and reduce technical losses	Target figures shown are only indicative

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Output		Number of Interconnecting sub-transmission links	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of Interconnecting sub-transmission links – ***Accra East***	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of Interconnecting sub-transmission links – ***Accra West***	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of medium voltage offloading circuits	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of medium voltage offloading circuits – ***Accra East***	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of medium voltage offloading circuits – ***Accra West***	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of automated reading meters	Number	Cumulative	0 (2016)	0	1050	2130	3180	3180	3180	No	Target figure represents the number of automated reading meters to be installed to reduce technical losses	Target figures shown are only indicative
Output		Number of automated reading meters – ***Accra East***	Number	Cumulative	0 (2016)	0	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of automated reading meters – ***Accra West***	Number	Cumulative	0 (2016)	0	TBD	TBD	TBD	TBD	TBD	No		

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Output		Number of automated reading meters – ***Domestic***	Number	Cumulative	0 (2016)	0	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of automated reading meters – ***Commercial***	Number	Cumulative	0 (2016)	0	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of automated reading meters – ***Industrial***	Number	Cumulative	0 (2016)	0	TBD	TBD	TBD	TBD	TBD	No		
Output		Medium voltage networks automation completed	Date	Date					3- Aug-20		3- Aug-20	No	Date indicates when MV automation will be complete as shown in EFOT work plan	
Output		Outage management system in place	Date	Date					24-Feb-20		25-Feb-20	No	Date indicates when Outage Management system will be in place as shown in the EFOT work plan	
Process	P-1	Value of signed power infrastructure feasibility and design contracts	US Dollars	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Process	P-2.1	Value disbursed of power infrastructure feasibility and design contracts	Percentage	Level	0 (2016)	TBD	TBD	TBD	TBD	100	TBD	No		The targets will be determined based on service contract payment schedule
Process	P-2	Percent disbursed of power infrastructure feasibility and design contracts	Percentage	Level	0 (2016)	TBD	TBD	TBD	TBD	100	100	No		The targets will be determined based on service contract payment schedule
Process	P-3	Value of signed power infrastructure construction contracts	US Dollars	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Process	P-4.1	Value disbursed of power infrastructure construction contracts	Percentage	Level	0 (2016)	TBD	TBD	TBD	TBD	100	100	No		The targets will be determined based on works contract payment schedule
Process	P-4	Percent disbursed of power infrastructure construction contracts	Percentage	Level	0 (2016)	TBD	TBD	TBD	TBD	100	100	No		The targets will be determined based on works contract payment schedule
Process	P-5	Temporary employment generated in power infrastructure projects	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Process	P-5	Temporary employment generated in power infrastructure projects (Male)	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects (Female)	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects (Skilled)	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects (Semi-skilled)	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Process	P-5	Temporary employment generated in power infrastructure projects (Unskilled)	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects (Ghanaian)	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects (Non-Ghanaian)	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process		Contract signed with ECG PSP Provider	Date	Date		31- Jul-17					31- Jul-17	No	Date for commencement of PSP a key milestone for second disbursement	
NEDCO FINANCIAL AND OPERATIONAL TURNAROUND PROJECT														
Outcome	P-19	Distribution system losses:	Percentage	Level	23.1% (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target setting awaiting project re-design
Outcome	P-19	Distribution system losses ***(Tamale Station)***	Percentage	Level	29.7% (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target setting awaiting project re-design
Outcome		Technical losses	Percentage	Level	12.1% (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target setting awaiting project re-design
Outcome		Technical losses (***Tamale Station)***	Percentage	Level	15.6% (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target setting awaiting project re-design
Outcome	P-20	Commercial losses	Percentage	Level	11.0% (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target setting awaiting project re-design

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Outcome	P-20	Commercial losses **(Tamale Station)**	Percentage	Level	14.1% (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target setting awaiting project re-design
Outcome		Percentage of pre-payment customers	Percentage	Level	5.83 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target setting awaiting project re-design
Outcome		Percentage of pre-payment customers ***Residential:***	Percentage	Level	5.61 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target to be set after project re-design
Outcome		Percentage of pre-payment customers ***Commercial:***	Percentage	Level	6.78 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target setting awaiting project re-design
Outcome		Percentage of pre-payment customers ***Industrial:***	Percentage	Level	0 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target setting awaiting project re-design
Outcome	P-21	System Average Interruption Duration Index (SAIDI)	Hours	Level	278.9 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target setting awaiting project re-design
Outcome	P-21	System Average Interruption Duration Index (SAIDI) ***Tamale Station***	Hours	Level	335.6 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target setting awaiting project re-design
Outcome	P-22	System Average Interruption Frequency Index (SAIFI)	Rate	Level	161.4 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target setting awaiting project re-design
Outcome	P-22	System Average Interruption Frequency Index (SAIFI) ***Tamale Station***	Rate	Level	147.1 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target setting awaiting project re-design

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Outcome		Ratio of actual maintenance expenditures to planned maintenance budget	Percentage	Level	82% (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target setting awaiting project re-design
Outcome	P-13	Maintenance expenditure-asset value ratio	Percentage	Level	3% (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Awaiting project redesign to set target for this indicator
Outcome	P-24	Operating cost-recovery ratio	Percentage	Level	78% (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Awaiting project redesign to set target for this indicator
Outcome		Average collection period	Days	Level	538 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Awaiting project redesign to set target for this indicator. Disaggregation for the baseline to be determine
Outcome		Aged Receivables as percentage of total sales	Percentage	Level	98% (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Awaiting project redesign to set target for this indicator
Outcome		Average payment period to power producer (VRA)	Days	Level	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		Baseline data will be determine after consultation with VRA
Outcome		Average payment period to Ghana Grid Company	Days	Level	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		Baseline data will be determine after consultation with VRA.
Outcome	P-23	Total electricity sold	Megawatt	Level	688,000 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Awaiting project redesign to set target for this indicator .Disaggregation for the baseline to be determine
Outcome	P-23	Total electricity sold- ***Residential***	Megawatt hours	Level	TBD	TBD	TBD	TBD	TBD	TBD		No		Awaiting project redesign to set target for this indicator .Disaggregation for the baseline to be determine
Outcome	P-23	Total electricity sold - ***Commercial***	Megawatt hours	Level	TBD	TBD	TBD	TBD	TBD	TBD		No		Awaiting project redesign to set target for this indicator .Disaggregation for the baseline to be determine
Outcome	P-23	Total electricity sold – ***Industrial***	Megawatt hours	Level	TBD	TBD	TBD	TBD	TBD	TBD		No		Awaiting project redesign to set target for this indicator .Disaggregation for the baseline to be determine

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Output	P-10	Kilometers of distribution lines upgraded or built	Kilometers	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		Awaiting project redesign to set target for this indicator
Output	P-10	Kilometers of distribution lines upgraded or built *High voltage (33kV)*	Kilometers	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		Awaiting project redesign to set target for this indicator
Output	P-10	Kilometers of distribution lines upgraded or built ***(medium voltage (11Kv)***	Kilometers	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		Awaiting project redesign to set target for this indicator
Output	P-10	Kilometers of distribution lines upgraded or built-*low voltage*	Kilometers	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		Awaiting project redesign to set target for this indicator
Output	P-11	Distribution substation capacity added	Megavolt Ampere	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		Awaiting project redesign to set target for this indicator.
Process	P-1	Value of signed power infrastructure feasibility and design contracts	US Dollars	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		The target will be determined based on works contract payment schedule
Process	P-2.1	Value disbursed of power infrastructure feasibility and design contracts	Percentage	Level	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		The target will be determined based on works contract payment schedule
Process	P.2	Percent disbursed of power infrastructure feasibility and design contracts	Percentage	Level	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		The target will be determined based on works contract payment schedule
Process	P-3	Value of signed power infrastructure construction contracts	US Dollars	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		The target will be determined based on works contract payment schedule
Process	P-4.1	Value disbursed of power infrastructure construction contracts	Percentage	Level	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		The target will be determined based on works contract payment schedule

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Process	P-4	Percent disbursed of power infrastructure construction contracts	Percentage	Level	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		The target will be determined based on works contract payment schedule
Process		Temporary employment generated in energy infrastructure projects	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Process	P-5	Temporary employment generated in power infrastructure projects (Male)	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects (Female)	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects (Skilled)	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects (Semi-skilled)	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects (Unskilled)	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects (Ghanaian)	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Process	P-5	Temporary employment generated in power infrastructure projects (Non-Ghanaian)	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
REGULATORY STRENGTHENING AND CAPACITY BUILDING PROJECT														
Outcome		Tariff adjustment on time	Date	Date	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		Baseline and Target to be set after signing IEA with PURC
Outcome		Tariff adjustment formula applied	Number	Level	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		Baseline and Target to be set after signing IEA with PURC
Sector Performance Monitoring Capacity Building Activity														
Output		Number of training participants ***Male***	Number	Cumulative	0 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Baseline and Target to be set after signing IEA with PURC
Output		Number of training participants ***Female***	Number	Cumulative	0 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Baseline and Target to be set after signing IEA with PURC
Output		Capacity Needs Assessment	Date	Date	23-Aug-2017	TBD	TBD	TBD	TBD	TBD	23-Aug-2017	No		Baseline and Target to be set after signing IEA with PURC
Tariff Review and Regulatory Activity														
Output	P-14	Cost-reflective tariff regime	Percentage	Level	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		Baseline and Target to be set after the IEA has been signed with PURC
Output		Tariff plan in place	Date	Level	5-Sep-2017	TBD	TBD	TBD	TBD	TBD	5-Sep-2017	No		Baseline and Target to be set after the IEA has been signed with PURC
ACCESS PROJECT[14]														
Access Project Process Indicators														
Process	P-1	Value of signed power infrastructure feasibility and design contracts	US Dollars	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target to be determined based on contracts sum in services Agreement following negotiations

[14] Baselines and targets for output and outcome level Indicators to be established upon completion of the Access Project design, which is currently ongoing.

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Process	P-2.1	Value disbursed of Power infrastructure feasibility and design contracts	US Dollars	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	Yes		Targets to be determined based on services contracts payment schedules
Process	P-2	Percent disbursed of Power infrastructure feasibility and design contracts	Percentage	Level	0 (2016)	TBD	TBD	TBD	TBD	100	100	No		Targets to be determined based on services contracts payment schedules
Process	P-3	Value of signed Power infrastructure construction contracts	US Dollars	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		Target to be determined based on contracts sum in works Agreement following negotiations
Process	P-4.1	Value disbursed of Power infrastructure construction contracts	US Dollars	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	Yes		Targets to be determined based on works contracts payment schedules
Process	P-4	Percent disbursed of Power infrastructure construction contracts	Percentage	Level	0 (2016)	TBD	TBD	TBD	TBD	100	100	No		Targets to be determined based on works contracts payment schedule
Process	P-5	Temporary employment generated in Power infrastructure projects	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
	P-5	Temporary employment generated in Power infrastructure projects - ***male***	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
	P-5	Temporary employment generated in Power infrastructure projects - ***female***	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
	P-5	Temporary employment generated in power infrastructure projects - ***skilled***	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
	P-5	Temporary employment generated in Power infrastructure projects – ***semi-skilled***	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
	P-5	Temporary employment generated in Power infrastructure projects - ***unskilled***	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
	P-5	Temporary employment generated in Power infrastructure projects - ***Ghanaian***	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
	P-5	Temporary employment generated in Power infrastructure projects – ***Non-Ghanaian***	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
POWER GENERATION SECTOR IMPROVEMENT PROJECT														
Outcome		Total system load shed	Megawatt hours	Level (Cumula-tive)	373,895 (2015)	TBD	TBD	TBD	TBD	TBD	TBD	No		Discussing with GRIDCo and MoP to set target
Outcome		Frequency of load shed	Number	Level	211 (2013)	TBD	TBD	TBD	TBD	TBD	TBD	No		Discussing with GRIDCo and MoP to set target

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Outcome		Duration of load shed	Number	Level	4255 (2013)	TBD	TBD	TBD	TBD	TBD	TBD	No		Discussing with GRIDCo and MoP to set target
Outcome	P-17	Installed generation capacity	Megawatts	Level	2,831 (2014)	TBD	TBD	TBD	TBD	TBD	5,000	No	Target set will be based on government policy	
Outcome	P-17	Installed generation capacity ***On-Grid***	Megawatts	Level	2,831 (2014)	TBD	TBD	TBD	TBD	TBD	TBD	No	Target set will be based on government policy	
Outcome	P-17	Installed generation capacity ***Off-Grid***	Megawatts	Level	TBD	TBD	TBD	TBD	TBD	TBD	TDB	No	No accurate data available currently	Working with EC and MoP to resolve baseline and set target
Outcome	P-17	Available generation capacity	Megawatts	Level	1,482 (2014)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Outcome	P-17	Available generation capacity ***On-Grid***	Megawatts	Level	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		
Outcome	P-17	Available generation capacity ***Off-Grid***	Megawatts	Level	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		
Outcome		Value of private investment in the energy sector	US Dollars	Level (Cumula-tive)	TBD					TBD	TBD	No		
Outcome		IPP Generation committed	Megawatts	Cumulative	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		The baseline as at 2015 was estimated to be between 1,800 and 1,900 MW; the actual is to be confirmed. Depending on the actual baseline, the target would be set between 3,250 and 3,300 MW.
Outcome		Number of IPPs that achieve financial close	Number	Cumulative	10 (2016)	TBD	TBD	TBD	TBD	TBD	19	No		

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Outcome	P-15	Total electricity supply	Megawatt hours	Cumulative	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		
Outcome	P-15	Total electricity supply ***Domestic***	Megawatt hours	Cumulative	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		
Outcome	P-15	Total electricity supply ***Imports***	Megawatt hours	Cumulative	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		
Outcome	P-15	Total electricity supply ***IPP***	Megawatt hours	Cumulative	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		
Outcome	P-15	Total electricity supply ***GoG***	Megawatt hours	Cumulative	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		
Outcome	P-16	Power plant availability	Percentage	Level	TBD	TBD	TBD	TBD	TBD	TBD	TBD	No		
Operationalization of the "Gas to Power" Plan and Commercialization of the Gas Sector Activity														
Output		Number of advisory days provided	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of training participants	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of training participants (Service provider)	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of training participants (Regulator)	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of training participants (Male)	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of training participants (Female)	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
ENERGY EFFICIENCY AND DEMAND SIDE MANAGEMENT														
Outcome		Energy savings from upgraded streetlights	Kilowatt Hours	Cumulative	0 (2016)	0	0	0	0	30,000,000	30,000,000	Yes	Street lighting project will account for 50% of total reduction in energy demand estimated at 60 million kWh by year 5 (refer DSM ERR model).	
Outcome		Energy savings from "race to retrofit"	Kilowatt Hours	Cumulative	0 (2016)	0	0	0	0	6,000,000	6,000,000	Yes	Race to retrofit / renewables project will account for 10% total reduction in energy demand estimated at 60 million kWh by year 5 (refer DSM ERR model).	
Outcome		Energy savings from "race to retrofit" - ***MDAs***	Kilowatt Hours	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	Yes		
Outcome		Energy savings from "race to retrofit" - ***MMDAs***	Kilowatt Hours	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	Yes		
Outcome		Energy savings from standards and labels	Kilowatt Hours	Cumulative	0 (2016)	0	0	0	0	24,000,000	24,000,000	Yes	Standards and labels project will account for 40% of total reduction in energy demand estimated at 60 million kWh by year 5 (refer DSM ERR model).	
Outcome		Percentage of appliances compliant with standards	Percentage	Level	0 (2016)	0	TBD	TBD	TBD	TBD	TBD	Yes	Target to be established based on the EC experience with the refrigerator project	
Outcome		Percentage of appliances compliant with standards - ***cooling***	Percentage	Level	0 (2016)	0	N/A	N/A	N/A	N/A	N/A	Yes	Target to be established based on the EC experience with the refrigerator project	

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Outcome		Percentage of appliances compliant with standards - ***heating***	Percentage	Level	0 (2016)	0	N/A	N/A	N/A	N/A	N/A	Yes	Target to be established based on the EC experience with the refrigerator project	
Outcome		Percentage of appliances compliant with standards - ***lighting***	Percentage	Level	0 (2016)	0	N/A	N/A	N/A	N/A	N/A	Yes	Target to be established based on the EC experience with the refrigerator project	
Outcome		Percentage of appliances compliant with standards - ***motor***	Percentage	Level	0 (2016)	0	N/A	N/A	N/A	N/A	N/A	Yes	Target to be established based on the EC experience with the refrigerator project	
Development and Enforcement of Standards and Labels														
Output		Number of products with standards developed and passed	Number	Cumulative	0 (2016)	0	5	10	15	20	20	Yes	Every product must have standards backed by a LI for effective implementation and compliance. Therefore 20 products will require 20 LIs.	Legislations on Standards of 3 products (electrical appliances) already passed and in force prior to Compact 2. These would be amended to reflect upgraded standards
Output		Number of appliance test labs established	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No	Target to be determined after design and feasibility studies	A new test lab will be constructed and equipped for Air conditioners, whiles existing labs will be equipped for other products
Improved Energy Auditing														
Output		Number of institutions participating in "race to retrofit"	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of institutions participating in "race to retrofit" - ***MDAs***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Output		Number of institutions participating in "race to retrofit" – ***MMDAs***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Output		Number of energy audits	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of energy audits - ***public***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Output		Number of energy audits - ***private***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Output		Number of buildings retrofitted	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of buildings retrofitted – ***MDAs***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Output		Number of buildings retrofitted – ***MMDAs***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Output		Number of people trained in energy auditing	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of people trained in energy auditing – ***male***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Output		Number of people trained in energy auditing - ***female***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Education and Public Information														
Output		Number of public education campaigns	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Output		Number of Public education campaigns - ***print***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Output		Number of Public education campaigns - ***electronic***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Output		Number of Public education campaigns - ***online***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Output		Number of students reached	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No	Target based on pilot schools only	
Output		Number of students reached – ***male***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Output		Number of students reached - ***female***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
DSM Infrastructure														
Output		Number of energy saving streetlights	Number	Cumulative	0 (2016)	TBD	6,000	TBD	TBD	TBD	TBD	Yes	End of compact target to be determined based on outcome of feasibility and design studies	

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Output		Number of energy saving streetlights – ***lamp only***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	Yes	Target may be determined based on outcome of feasibility and design studies	
Output		Number of energy saving streetlights – ***lamp and pole***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	Yes	Target may be determined based on outcome of feasibility and design studies	
Energy Efficiency and Demand Side Management Project Process Milestones														
Process	P-1	Value of signed power infrastructure feasibility and design contracts	US Dollars	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	Yes	Target to be determined based on contracts sum in services Agreement following negotiations	
Process	P-2.1	Value disbursed of power infrastructure feasibility and design contracts	US Dollars	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	Yes	Targets to be determined based on services contracts payment schedules	
Process	P-2	Percent disbursed of power infrastructure feasibility and design contracts	Percentage	Level	0 (2016)	TBD	TBD	TBD	TBD	100	100	Yes	Targets to be determined based on services contracts payment schedules	
Process	P-3	Value of signed power infrastructure construction contracts	US Dollars	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	Yes	Target to be determined based on contracts sum in works Agreement following negotiations	
Process	P-4.1	Value disbursed of power infrastructure construction contracts	US Dollars	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	Yes	Targets to be determined based on works contracts payment schedules	
Process	P-4	Percent disbursed of power infrastructure construction contracts	Percentage	Level	0 (2016)	TBD	TBD	TBD	TBD	100	100	Yes	Targets to be determined based on works contracts payment schedule	
Process	P-5	Temporary employment generated in power infrastructure projects	Number	Cumulative	0 (2016)	TBD	TBD	TBD	TBD	TBD	TBD	No		
Process	P-5	Temporary employment generated in power infrastructure projects - ***male***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		

Indicator Level	CI Code	Indicator Name	Unit of Measure	Indicator Classifi-cation	Baseline	Year 1	Year 2	Year 3	Year 4	Year 5	End of Compact Target	ERR Linked	Justification and Assumptions for Targets	Notes
						2017	**2018**	**2019**	**2020**	**2021**				
Process	P-5	Temporary employment generated in power infrastructure projects - ***female***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects - ***skilled***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects – ***semi-skilled***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects - ***unskilled***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects - ***Ghanaian***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		
Process	P-5	Temporary employment generated in power infrastructure projects – ***Non-Ghanaian***	Number	Cumulative	0 (2016)	N/A	N/A	N/A	N/A	N/A	N/A	No		

ANNEX III: M&E PLAN MODIFICATIONS

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
Compact-Wide Indicators								
Reduced cost of doing business	No	Outcome	Percent of firms citing electricity as a major obstacle to doing business	Percentage	Percentage of firms identifying electricity as a major constraint	(1) Change the data source from WB Enterprise Survey or PFG Survey to Enterprise Survey (2) Change the indicator baseline from 86.2 (2007) to TBD	The reduction in the percentage of firms citing electricity as a major obstacle to doing business will provide an indication of the extent to which the business environment has improved.	Uncertainty with the timing of the recommended Surveys (1) While the 2014 WB Enterprise Survey can provide baseline data, we cannot be certain that the World Bank will carry out another survey at the close to the end of the Compact. (2) Change in data source
Reduced cost of doing business	No	Outcome	Sales losses due to power outages	Percentage	Average value of sales losses due to electricity outages as a percentage of revenue	(1) Change the data source from WB Enterprise Survey or PFG Survey to Enterprise Survey (2) Change the indicator baseline from 6 (2007) to TBD	The reduction in the percentage of firms citing electricity as a major obstacle to doing business will provide an indication of the extent to which the business environment has improved.	Uncertainty with the timing of the recommended Surveys (1) While the 2014 WB Enterprise Survey can provide baseline data, we cannot be certain that the World Bank will carry out another survey at the close to the end of the Compact. (2) Change in data source
Reduced cost of doing business	No	Outcome	Diesel fuel consumption by firms	Percentage	Average annual kWh of diesel generation consumed by registered firms as a percentage of total kWh of electricity consumed	(1) Change the data source from WB Enterprise Survey or PFG Survey to Enterprise Survey (2) Change the indicator baseline from 29.5 (2007) to TBD	This indicator is a proxy for economic, environmental and business impacts. The use of diesel fuel for power generation by firms is an indication of the unreliable supply and quality of power. Reduction in the use will provide an indication of the improved business environment in relation to power availability.	Uncertainty with the timing of the recommended Surveys (1) While the 2014 WB Enterprise Survey can provide baseline data, we cannot be certain that the World Bank will carry out another survey at the close to the end of the Compact.

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
								(2) Change in data source
Improved reliability of electricity system	Yes	Outcome	System Average Interruption Duration Index (SAIDI)	Hours	Sum of durations, in customer-hours, of all customer interruptions in a quarter / Total number of customers connected to network in the same quarter.	(1) Indicator deleted	Provides a measure for the duration of outages. Also, there are regulations that limit the duration of outages, which when exceeded could trigger penalty for the service provider.	(1) Indicator appears also under ECG Financial and Technical Turnover Project. It is more appropriate to keep it under the ECG Financial and Technical Turnover Project since, by the definition, it seeks to measure the performance of this Project
Improved reliability of electricity system	Yes	Outcome	System Average Interruption Frequency Index (SAIFI)	Number	Sum of customer-interruptions in a quarter / Total number of customers connected to network in the same quarter.	(1) Indicator deleted	Provides a measure for the extent of outages. Also, there are regulations that limit the extent of outages, which when exceeded could trigger penalty for the service provider.	(1) Indicator appears also under ECG Financial and Technical Turnover Project. It is more appropriate to keep it under the ECG Financial and Technical Turnover Project since, by the definition, it seeks to measure the performance of this Project (2)
Customers	Yes	Outcome	Number of customers connected to the national network	Number (ECG)		(1) Indicator modified as follows: Number of ECG customers connected to the national network	To measure growth in grid connections and household access to electricity in ECG service area. An individual customer is equivalent to a household or firm.	(1) To make the indicator specific and remove ambiguity
Customers	Yes	Outcome	Number of customers connected to the national network	Number (NEDCo)		(1) Indicator modified as follows: **Number of NEDCo customers connected to the national network**	To measure growth in grid connections and household access to electricity in NEDCo service area. An individual customer is equivalent to a household or firm.	(1) To make the indicator specific and remove ambiguity

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
ECG Financial and Operational Turnaround Project								
Reinvestment and maintenance in capital expenditure	No	Outcome	Capital Expenditure (CAPEX)	US Dollars	Total value of new equipment installed in the distribution network	Indicator dropped	To provide an indication of how much investment in new equipment is made in ECG to improve service quality.	It may be difficult to obtain reliable data on this indicator
Reinvestment and maintenance in capital expenditure	No	Outcome	Ratio of actual Maintenance expenditure to the dollar value of total distribution assets	Percentage	Actual maintenance expenditures / Total value of distribution assets	(1) Indicator name changed to: Maintenance expenditure-asset value ratio (2) Indicator definition changed to the following: Actual maintenance expenditures / Total value of fixed assets (3) Indicator baseline value changed from 0.98% in 2012 to 1.30% in 2014	A measure of whether ECG is able to continue providing services at the same level of performance when assets were acquired, and to maximize returns on investments.	Definition altered to conform with "Common indicator" name and definition Baseline value was updated as 2014 data become available
Distribution system losses reduced	No	Outcome	Distribution system losses (ATC&C)	Percentage	Cash Recovery Index= (1- system losses)* collection rate ATC&C = 1- Cash Recovery Index	Indicator Dropped	Measure of distribution system losses by ECG	Other indicators in the M&E Plan will be provided the needed information
Distribution system losses reduced	No	Outcome	Distribution system losses	Percentage	1 – [Total megawatt hours billed / Total megawatt hours received from transmission]	New indicator added	Measure of distribution system losses by ECG	New indicator included to track Distribution System Losses incurred by ECG
Enhanced investment capacity	No	Outcome	Asset Turnover	Ratio	Gross sales / total assets	Indicator Dropped	To measure the efficiency of ECG's use of its assets in generating revenue	New indicators have been included in the M&E Plan that adequately tracks ECG's financial health
Utility Financial Health improved	No	Outcome	Operating Profit (loss)	US Dollars	Operating revenue minus operating expenses	Indicator Dropped	To provide an indication of the profit ECG is making through its operations. This is an indication of ECG's financial health.	New indicators have been included in the M&E Plan that adequately tracks ECGs financial health
Distribution system losses reduced	No	Outcome	Technical losses	Percentage	Estimated MWh of power dissipated in electricity system components such as distribution lines, transformers	Indicator baseline value changed from 14% in 2012 for Accra East and West to 10.07% in 2015	To measure improvements or otherwise in ECG's technical losses, which constitute a loss of revenue and impacts on its financial performance	Baseline value was updated with data from ECG for 2015

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
Distribution system losses reduced	No	Outcome	Commercial Losses	Percentage	Total distribution system losses minus distribution technical losses	Indicator baseline value changed from 19.5% in 2012 for Accra East and West to 23.69% in 2015	To measure improvements or otherwise in ECG's commercial losses, which constitute a loss of revenue and impacts on its financial performance	Baseline value was updated with data from ECG for 2015
Distribution system losses reduced	No	Outcome	Percentage of pre-payment customers	Percentage	Number of customers with pre-payment meters divided by Total number of customers with legacy credit meters and with pre-payment meters in the ECG Target Regions	New indicator added	A measure of the percentage of pre-payment customers	To track the percentage of customers with pre-paid meters. The prepaid meters contributes to reducing collection losses and the cost of collection, and thereby improving ECG's financial health
Outage response time improved	Yes	Outcome	System Average Interruption Duration Index (SAIDI)	Hours	Sum of durations, in customer-hours, of all customer interruptions in a quarter / Total number of customers connected to network in the same quarter in Accra East and Accra West.	Indicator baseline value changed from TBD in 2012 to: Accra East 129.16, Accra West 256.25, Global 185.48 (in 2015)	To measure the average outage duration for each ECG customer. A reduction in SAIDI will improve ECG's service delivery and increase sales	Baseline value was updated with data from ECG for 2015
Unplanned outages and faults reduced	Yes	Outcome	System Average Interruption Frequency Index (SAIFI)	Rate	Sum of customer-interruptions in a quarter / Total number of customers connected to network in the same quarter in Accra East and Accra West.	Indicator baseline value changed from TBD in 2012 Accra East = 42.09 Accra West = 104.91, Global = 84.54 in 2015	To measure the average number of interruptions in electricity supply that each ECG customers experiences. A reduction in SAIFI will improve ECG's service delivery and increase sales	Baseline value was updated with data from ECG for 2016
Enhanced investment capacity	No	Outcome	Operating Cost recovery ratio	Percentage	Total revenue collected/Total Operation Cost	New indicator added	A measure of the cash flow available for investment	New indicator recommended by DQR consultant and included to track ECG's investment capacity and financial health
Utility Financial Health Improved	No	Outcome	Average Collection Period	Days	365 Days * [(Beginning accounts receivables + ending accounts receivable) / 2) / Total sales]	New indicator added	A measure of the liquidity or financial security of ECG and the efficiency of revenue collection	New indicator included to track ECG's revenue collection efficiency

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
	No	Outcome	Debt as a percentage of total sales	Percentage	Total value of accounts receivables over 60 days / Total accounts receivable	New indicator added	Measure of ECG's financial losses due to bad debt	New indicator included to track the percentage of ECG's total sales that becomes bad debt
	No	Outcome	Total Electricity Sold	Mega Watts	The total megawatt hours of electricity sales to all customer types	New indicator added	Measure total electricity sold to customers by ECG	New indicator recommended by DQR consultant and included to track megawatts of Electricity sold by ECG
	No	Outcome	Maintenance expenditure-asset value ratio	Percentage	Actual maintenance expenditures / Total value of fixed assets	New indicator added	To provide an indication of ECG's ability to continue providing services at the same level of performance when assets were acquired, and to maximize returns on investments.	New Indicator included to track ECG'S financial health
Timely payments made to sector entities	No	Outcome	Average payment period to power producers	Days	Duration in days of measurement period * [(Beginning accounts payables to power producers + ending accounts payables to power producers) / 2) /Power purchase cost during measurement period]	Indicator definition changed to the following: Duration in days of measurement period * [(Beginning accounts payables to power producers + ending accounts payables to power producers) / 2) /Power purchase cost during measurement period]	To measure the time it takes to pay power producers	Definition altered to include suggestions made by DQR consultant
	No	Outcome	Average payment period to Ghana Grid Company	Days	Duration in days of measurement period * [(Beginning accounts payables to GRIDCo + ending accounts payables to GRIDCo) / 2) /Total transmission charge payable to GRIDCO during the measurement period]	Indicator definition changed to the following: Duration in days of measurement period * [(Beginning accounts payables to GRIDCo + ending accounts payables to GRIDCo) / 2) /Total transmission charge payable to GRIDCO during the measurement period]	To measure the time it takes to pay GRIDCo	Definition altered to include suggestions made by DQR consultant
Enhanced investment capacity	No	Output	GIS-based distribution management system in place	Date	Geographic Information System (GIS) based distribution management system, grid digitization, and customer census to record and store basic	New indicator added	The GIS system is considered a base investment under EFOT as such there is the need to monitor its timely deployment to ensure other planned activities are implemented within the Compact period	Indicator introduced to track the date the GIS system is put in place which is a key milestone

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
					data for planning purposes in place.			
	No	Output	Enterprise Resource Planning System in place	Date	Date when Enterprise Resource Planning (ERP) system a business process management software which will be integrated with existing applications for the purpose of facilitating the flow of information within ECG and managing connections to outside stakeholders will be in place	New indicator added	The ERPS is one of the base investments under EFOT as a result it is useful to track the date it is put in place as well as ensure that timelines for this activity does not slip	Indicator introduced to track the date the ERP system is put in place. This is a key milestone
Technical losses reduced	No	Output	Kilometers of distribution lines upgraded or built	Kilometers	The sum of linear kilometers of new, reconstructed, rehabilitated, or upgraded distribution lines that have been energized, tested and commissioned with MCC support.	New indicator added	To measure of the sum of linear kilometers of lines upgraded or built under the Compact to improve network reliability in Accra East and West	New indicator included to track the sum of linear kilometers of lines upgraded or built under the Compact
	No	Output	Distribution substation added	Number	The total number of newly constructed distribution substations supported by MCC	New indicator added	Measure of Distribution substations added to improve network reliability in Accra East and West	New indicator included to track Distribution substation capacity added
Technical losses reduced	No	Output	Number of capacitor banks installed at primary substations/lines	Number	Total number of capacitor banks installed at primary substations/lines for Reactive Power Compensation	New indicator added	Reactive power compensation installed at primary substation will improve the network, reducing technical losses and avoiding extended outages.	To track activities intended to reduce technical losses in Accra East and West
	No	Output	Number of Bulk supply points	Number	Number of BSPs installed and commissioned	New indicator added	A measure of technical loss reduction	To track activities intended to reduce technical losses in Accra East and West

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
	No	Output	Number of Interconnecting sub-transmission links	Number	Interconnecting sub-transmission links installed	New indicator added	A measure of technical loss reduction and improved levels of reliability in the network	New indicator included to track the Project's ability to improve technical losses and levels of reliability in the network in Accra East and West
	No	Output	Number of medium voltage offloading circuits	Number	Total number of medium voltage offloading circuits installed	New indicator added	A measure of technical loss reduction and improved levels of reliability in the network	New indicator included to track the Project's ability to improve technical losses and levels of reliability in the network in Accra East and West
Distribution system losses reduced	No	Output	Number of automated reading meters	Number	Installation of automated reading meters at special load tariff (SLT) service locations, selected non-SLT service locations in the ECG Target Regions, and at critical nodes of the distribution system in the Target ECG Regions	New indicator added	A measure of the number of automated reading meters installed as part of the Compact	To track the number of automated reading meters installed to provide ECG with the ability to monitor where technical and commercial losses are occurring
Date Milestones Achieved	No	Date	Medium voltage networks automation completed	Date	Date when Medium voltage networks automation is completed	New indicator added	To track when the Medium voltage networks automation is completed. A key activity under EFOT	To track date when Medium voltage networks automation is completed
	No	Date	Outage management system in place	Date	Date when system for identifying and resolving outages is commissioned for use	New indicator added	To track when the outage management system is in place	To track date when Outage Management system, a key activity under EFOT is commissioned
Process Milestones Achieved	No	Process	Value of signed power infrastructure feasibility and design contracts	US Dollars	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.	New indicator added	Measures the value of power infrastructure contracts signed in US dollars	To provide an indication of the value of power infrastructure feasibility and design contracts signed under the Compact
	No	Process	Value disbursed of power infrastructure	US Dollars	The amount disbursed of all signed feasibility, design, and environmental impact	New indicator added		To track funds disbursed under the Access project infrastructure feasibility and

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
			feasibility and design contracts		assessment contracts, including resettlement action plans, for power infrastructure using 609(g) and compact funds.			design studies contracts signed.
	No	Process	Percent disbursed of power infrastructure feasibility and design contracts	Percentage	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.	New indicator added	Measures the percent disbursed of power infrastructure feasibility and design contracts	To track percentage of funds disbursed on power infrastructure contracts, to provide an indication of progress towards completing on target.
	No	Process	Value of signed power infrastructure construction contracts	US Dollars	The value of all signed construction contracts for power infrastructure investments using compact funds.	New indicator added	Measure the value of signed power infrastructure construction contracts	To provide indication of the value of power infrastructure feasibility and design contracts signed under the Compact
	No	Process	Value disbursed of power infrastructure construction contracts	US Dollars	The amount disbursed of all signed construction contracts for power infrastructure investments using compact funds.	New indicator added		To track funds disbursed under the Access project infrastructure feasibility and design studies contracts signed.
	No	Process	Percent disbursed of power infrastructure construction contracts	Percentage	The total amount of all signed construction contracts for power infrastructure investments disbursed divided by the total current value of all signed contracts.	New indicator added		To track funds disbursed under the power infrastructure construction contracts signed
	No	Process	Temporary employment generated in power infrastructure projects	Number	The number of people temporarily employed or contracted by MCA-contracted construction companies to work on construction of new power infrastructure or reconstruction,	New indicator added	A measure of Temporary employment generated in power infrastructure projects under the Compact	To track the number of temporary employment generated by energy infrastructure contracts under the Compact

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
					rehabilitation, or upgrading of existing power infrastructure.			
	No	Process	Contract signed with ECG PSP Provider	Date	Date on which Contract signed with PSP Provider for ECG that is acceptable to both GOG and MCC	New indicator added	A measure of progress made on key milestones under the Compact	To track the date ECG PSP was signed which is a major milestone
NEDCo Financial and Operational Turnaround Project								
Reinvestment and maintenance in capital expenditure	No	Outcome	Capital Expenditure (CAPEX)	US Dollars	Total value of new equipment installed in the distribution network	Indicator dropped	To provide an indication of how much investment in new equipment is made in NEDCo's to improve service quality.	It may be difficult to obtain reliable data on this indicator
Distribution system losses reduced	No	Outcome	Distribution system losses	Percentage	1 – [Total megawatt hours billed / Total megawatt hours received from transmission]	New indicator added	To measure improvements or otherwise of NEDCo's distribution system losses as a result of Compact interventions	New indicator included to track Distribution System Losses incurred by NEDCo
Distribution system losses reduced	No	Outcome	Technical losses	Percentage	Estimated MWh of power dissipated in electricity system components such as distribution lines, transformers	New indicator added	To measure improvements or otherwise in NEDCo's technical losses, which constitute a loss of revenue and impacts on its financial performance	Indicator introduced to track improvements in technical losses
Distribution system losses reduced	No	Outcome	Commercial Losses	Percentage	Total distribution system losses minus distribution technical losses	New indicator added	To measure improvements or otherwise in NEDCo's commercial losses, which constitute a loss of revenue and impacts on its financial performance	Indicator introduced to track improvements in commercial losses
Distribution system losses reduced	No	Outcome	Percentage of pre-payment customers	Percentage	Number of customers with pre-payment meters divided by Total number of customers with legacy credit meters and with pre-payment meters in the NEDCo's Target Regions	New indicator added	A measure of the percentage of pre-payment customers	To track the percentage of customers with pre-paid meters. The prepaid meters contributes to reducing collection losses and the cost of collection, and thereby improving NEDCo's financial health

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
Outage response time improved	Yes	Outcome	System Average Interruption Duration Index (SAIDI)	Hours	Sum of durations, in customer-hours, of all customer interruptions in a quarter / Total number of customers connected to network in the same quarter in the NEDCo's Target Regions	New indicator added	To measure the average outage duration for each NEDCo's customer. A reduction in SAIDI will improve NEDCo's service delivery and increase sales	To measure the average outage duration for each NEDCo's customer. A reduction in SAIDI will improve NEDCo's service delivery and increase sales
Unplanned outages and faults reduced	Yes	Outcome	System Average Interruption Frequency Index (SAIFI)	Rate	Sum of customer-interruptions in a quarter / Total number of customers connected to network in the same quarter in the NEDCo's Target Regions.	New indicator added	To measure the average number of interruptions in electricity supply that each NEDCo's customers experiences. A reduction in SAIFI will improve ECG's service delivery and increase sales	To measure the average number of interruptions in electricity supply that each NEDCo's customers experiences. A reduction in SAIFI will improve ECG's service delivery and increase sales
Enhanced investment capacity		Outcome	Asset Turnover	Percentage	Gross sales divided by total assets	Dropped	A measure of how efficiently was the utility able to utilize its assets to generate sales	Definition altered to conform to the DQR recommendation and definition Baseline value was updated as 2015 data become available
Utility Financial Health improved	No	Outcome	Operating Profit (loss)	US Dollars	Operating revenue minus operating expenses	Dropped	It measures the difference between revenues and costs generated by NEDCo operations, before deducting interest, taxes, investment gains/losses and various non-recurring items	Baseline value was updated as 2015 data become available
	No	Outcome	Operating Cost recovery ratio	Percentage	Total revenue collected/Total Operation Cost	New indicator added	A measure of the NEDCo operating revenue to operating costs.	New indicator recommended by DQR consultant and included to track NEDCo's investment capacity and financial health
	No	Outcome	Average Collection Period	Days	365 Days * [(Beginning accounts receivables + ending accounts receivable) / 2) / Total sales]	New indicator added	A measure of the liquidity or financial security of NEDCo and the efficiency of revenue collection	New indicator included to track NEDCo's revenue collection efficiency

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
	No	Outcome	Debt Receivables as a percentage of total sales	Percentage	Total value of accounts receivables over 6days/Total accounts receivable	New indicator added	Measure of NEDCo's financial losses due to bad debt	New indicator included to track the percentage of NEDCo's total sales that becomes bad debt
	No	Outcome	Total Electricity Sold	Mega Watts	The total megawatt hours of electricity sales to all customer types	New indicator added	Measure total electricity sold to customers by NEDCo's	New indicator recommended by DQR consultant and included to track megawatts of Electricity sold by NEDCo's
Timely payments made to sector entities	No	Outcome	Average payment period to power producers	Days	Duration in days of measurement period * [(Beginning accounts payables to power producers + ending accounts payables to power producers) / 2) /Power purchase cost during measurement period]	New indicator added	To measure the time it takes to pay power producers	Indicator included to gauge NEDCo's credit worthiness
	No	Outcome	Average payment period to Ghana Grid Company	Days	Duration in days of measurement period * [(Beginning accounts payables to GRIDCo + ending accounts payables to GRIDCo) / 2) /Total transmission charge payable to GRIDCO during the measurement period]	New indicator added	To measure the time it takes to pay GRIDCo	Indicator included to gauge NEDCo's credit worthiness
Reinvestment and maintenance in capital expenditure	No	Outcome	Ratio of actual Maintenance expenditure to the dollar value of total distribution assets	Percentage	Actual maintenance expenditures / Total value of distribution assets	(1) Indicator name changed to: Maintenance expenditure-asset value ratio (2) Indicator definition changed to the following: Actual maintenance expenditures / Total value of fixed assets (3) Indicator baseline value changed from 0.6% in 2013 to 0.03% in 2015	A measure of whether NEDCo's is able to continue providing services at the same level of performance when assets were acquired, and to maximize returns on investments.	Definition altered to conform with "Common indicator" name and definition Baseline value was updated as 2015 data become available

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
Technical losses reduced	No	Output	Kilometers of distribution lines upgraded or built	Kilometers	The sum of linear kilometers of new, reconstructed, rehabilitated, or upgraded distribution lines that have been energized, tested and commissioned with MCC support.	New indicator added	To measure of the sum of linear kilometers of lines upgraded or built under the Compact to improve network reliability in NEDCo's operational areas	New indicator included to track the sum of linear kilometers of lines upgraded or built under the Compact
Technical losses reduced	No	Output	Distribution substation capacity added	Mega volt ampere	The total added substation capacity, measured in mega volt amperes that is energized, commissioned and accompanied by a test report and supervising engineer's certification resulting from new construction or refurbishment of existing substations supported by MCC.	New indicator added	Measure of Distribution substation capacity added to improve network reliability in NEDCo's operational areas	New indicator included to track Distribution substation capacity added
Process Milestones Achieved	No	Process	Value of signed power infrastructure feasibility and design contracts	US Dollars	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.	New indicator added	Measures the value of power infrastructure contracts signed in US dollars	To provide an indication of the value of power infrastructure feasibility and design contracts signed under the Compact
	No	Process	Value disbursed of power infrastructure feasibility and design contracts	Percentage	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.	New indicator added	Measure the value of disbursed power infrastructure construction contracts	To provide indication of the disbursed of power infrastructure feasibility and design contracts signed under the Compact

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
	No	Process	Percent disbursed of power infrastructure feasibility and design contracts	Percentage	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.	New indicator added	Measures the percent disbursed of power infrastructure feasibility and design contracts	To track percentage of funds disbursed on power infrastructure contracts, to provide an indication of progress towards completing on target.
	No	Process	Value of signed power infrastructure construction contracts	US Dollars	The value of all signed construction contracts for power infrastructure investments using compact funds.	New indicator added	Measure the value of signed power infrastructure construction contracts	To provide indication of the value of signed power infrastructure construction contracts under the Compact
	No	Process	Value disbursed of power infrastructure construction contracts	US Dollars	The amount disbursed of all signed construction contracts for power infrastructure investments using compact funds.	New indicator added	Measure the value of disbursed power infrastructure construction contracts	To provide indication of the value disbursed of power infrastructure construction contracts under the Compact
	No	Process	Percent disbursed of power infrastructure construction contracts	Percentage	The total amount of all signed construction contracts for power infrastructure investments disbursed divided by the total current value of all signed contracts.	New indicator added	Measure the percent disbursed of power infrastructure construction contracts	To track percentage of funds disbursed on power infrastructure construction contracts, to provide an indication of progress towards completing on target.
	No	Process	Temporary employment generated in power infrastructure projects		Number	New indicator added	A measure of Temporary employment generated in power infrastructure projects under the Compact	To track the number of temporary employment generated by energy infrastructure contracts under the Compact
Regulatory Strengthening and Capacity Building Project								
Cost reflective tariff	No	Outcome	Cost recovery ratio	Percentage	Tariff per kWh divided by average cost per kWh of electricity supplied to customers times 100	1. Indicator name has been dropped and replaced by Cost-reflective tariff regime. 2.The definition has been modified as: Average Tariff per kilowatt-hour / Long-run marginal cost per kilowatt-	Measures utilities' ability to cover expenditures with revenues.	To assess whether tariffs keep pace with Long-run Marginal Cost (LRMC as the denominator may itself be computed only once via the Tariff Study).

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
						hour of electricity supplied to customers		
Cost-reflective tariff	No	Outcome	Tariff plan in place	Date	Tariff Plan to guide the setting of tariffs by PURC in place	New Indicator		
Automatic tariff adjustment		Outcome	Tariff Adjustment on time	Date	Tariff adjusted on scheduled timeline	New indicator added	Measures ability to revise tariffs and adjust tariff schemes on schedule in other to cover costs with revenue	
Monitoring capacity of policy, planning and regulatory agencies strengthened	No	Output	Number of training participants	Number	Number of participants from organizations in the energy sector that participated in training to build their capacity	New Indicator added	Measure the number of individuals benefiting directly from the program and allows us to track the inclusion of women in Ghana Power Compact sponsored events.	
	No	Output	Number of organizations trained	Number	Number of different organizations in the energy sector that sent individuals for training	Indicator dropped	The indicator was selected to measure the extent of contribution towards closing the skills gap within the organizations in the energy sector that need institutional capacity support from the Compact II program.	
	No	Output	Capacity needs assessment	Date	Capacity and needs assessments with regards to data quality, monitoring systems (data collection, analysis, reporting, quality control, and communications) on key performance metrics identified for the	New Indicator added	The capacity and needs assessments and its timeliness is important in assessing the success of building the capacity of institutions for Sector Performance Monitoring.	

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
					Compact and Partnership for Growth for listing in the Electricity Supply and Distribution (Technical and Operational) Rules (L.I. 1816, 2005).			
Cost reflective tariff	No	Output	Partnership arrangements	Date	A partnership arrangement with qualified organizations comprised of state, national or international regulatory practitioners and technical experts in place for EC and PURC.	Indicator dropped	Information sharing with regulators and experts through partnership activities will help identify best practices in regulation as well as areas for improvement within the PURC and EC regulatory structures	
Access Project								
Process milestones achieved	No	Process	Value of signed Power infrastructure feasibility and design contracts	USD	The value of all signed feasibility, design, and environmental contracts, including resettlement action plans, for Access Project infrastructure investments under the Access Project using 609(g) and compact funds	Newly introduced indicator		To provide an indication of the level of financial commitment made to the MEEs and social institutions under the Access Project
	No	Process	Value disbursed of Power infrastructure feasibility and design contracts	USD	The amount disbursed of all signed feasibility, design, and environmental contracts, including resettlement action plans, for Access project infrastructure investments under the Access Project using 609(g) and compact funds	Newly introduced indicator		To provide indication of the value of Access Project infrastructure feasibility and design contracts signed under the Compact
	No	Process	Percent disbursed of Power infrastructure feasibility and design contracts	Percentage	The total amount of all signed feasibility, design, and environmental contracts, including resettlement action plans, for Access Project	Newly introduced indicator	As a proxy to give an indication of how close the project is to delivering (i) a design for bidding documents and (ii) for works to commence	To provide indication of how close the Access Project is to the completion of feasibility and design; and to the commencement

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
					infrastructure disbursed under the Access Project divided by the total value of all signed contracts.			of works and delivery of Project outputs
	No	Process	Value of signed Power infrastructure construction contracts	USD	The value of all signed construction contracts for power infrastructure investments using compact funds.	Newly introduced indicator		To provide indication of the value of Access Project infrastructure construction contracts signed under the Compact
	No	Process	Value disbursed of Power infrastructure construction contracts	USD	The amount disbursed of all signed construction contracts for Access project infrastructure investments using compact funds.			To track funds disbursed under the Access project infrastructure construction contracts signed.
	No	Process	Percent disbursed of Power infrastructure construction contracts	Percentage	The total amount of all signed construction contracts for power infrastructure investments disbursed divided by the total current value of all signed contracts.	Newly introduced indicator	As a proxy to give an indication of how close the project is in delivering its tangible product or output.	To track percentage of funds disbursed on power infrastructure contracts, to provide an indication of progress towards completion of of works.
	No	Process	Temporary employment generated in Power infrastructure projects	Number	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.	Newly introduced indicator	The Access project infrastructure construction projects will generate income, mostly for Ghanaians and between the gender divide	To track the number of temporary jobs generated under the Access infrastructure contracts
Power Generation Sector Improvement Project								
Load shedding and outages reduced	No	Outcome	Load shed	MWh	MWh of load shed from Transmission to Distribution during the year due to lack of available generation capacity	1) Indicator name changed to: Total Systems Load Shed 2) The indicator definition modified as: Total megawatt-hours shed in a year. 3) Indicator baseline value changed from TBD in 2013 to 373,895 in (2015	To measure extent and magnitude of generation shortfalls leading to planned outages	To make the indicator name more specific

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
	No	Outcome	Frequency of load shed	Number	Number of times in a year that load shedding occurred	1) Indicator definition changed to: Number of times that load shedding occurred in a quarter.	Measures the number of times in a quarter that load shedding occurred. As the enabling environment is created for IPPs to invest in generation, the amount of power installed plants could improve electricity situation to reduce frequency of load shedding and outages.	This is a recommendation from DQR Report (Vol. 1, p. 44) to change the frequency of reporting to quarter
	No	Outcome	Duration of load shed	Hours	Total duration in hours of load shed during the year	Indicator definition changed to: Total duration in hours of load shed in a quarter	Measures the total duration in hours of load shed during the year. Assumption is that, the amount of power installed plants could improve electricity situation to reduce load shedding and outages.	This is a recommendation from DQR Report (Vol. 1, p. 44) to change the frequency of reporting to quarter
	No	Outcome	Installed capacity	MW	Total amount of power installed plants can generate (capacity)	1. Indicator name changed to installed generation capacity. 2. Indicator definition changed to: Total generation capacity, in megawatts, installed plants can generate within the country. 3.Indicator baseline value changed from 2,840 in 2013 to 2,831 in 2014	Measures the amount of power installed plants can generate. Assumption is that, the installed plants could improve electricity situation to reduce load shedding and outages.	Definition altered to conform to "Common indicator" name and definition. Baseline value was updated as 2014 data become available
	No	Outcome	Available generation capacity	MW	Total amount of energy available for transmission to the end users	New indicator added	Measures megawatts of power produced by plants that are actually in operation. This provides a better picture of whether or not actual power supply is improving, thus reduction in load shed and outages	Recommendation from DQR .They indicated it is a more realistic indicator for actual usable generation capacity available considering plant maintenance, fuel availability, etc.
On-grid renewable energy increased	No	Outcome	Share of on-grid renewable energy	Percentage	Installed capacity (in MW) of on-grid renewable energy (as defined in Renewable Energy Act, 2011 (Act 832)) as a percentage of installed capacity (in MW) of on-grid conventional capacity.	1. Indicator name changed to: Share of renewable energy in the country. 2.Baseline value changed from 0.01 to 0.11 in 2014	The share of on-grid renewable energy is an indication of the level of diversification in power generation towards more sustainable sources	Definition altered to conform to "Common indicator" name and definition. Baseline value was updated as 2014 data become available

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
Off-grid and mini-grid renewable energy increased.	No	Outcome	Installed capacity	MW	Total number of MW installed capacity of off-grid and mini-grid renewables.	1.Indicator name changed to: Installed capacity (of renewable energy) 2.Baseline value changed from 0.8 to 3.8 in 2014	Measures the total number of MW installed capacity of off-grid and mini-grid renewables	Baseline value was updated with data from MoP for 2014
New IPP generation committed	No	Outcome	IPP Generation committed	MW	Total generation capacity committed by IPPs at Financial Close	Indicator baseline value is given as 1800-1900	Measures total generation capacity committed by new IPPs at Financial Close, and provides an indication of progress towards increasing power generation.	Baseline value was updated with data from EC for 2014
	No	Outcome	Number of IPPs that achieve financial close	Number	Number of IPPs that have secured financial agreement with financial institutions by satisfying all conditions or received a waiver, requisite documents fully executed, and draw-downs become permissible	New indicator added	Measures the number of IPP's that have secured financial agreement with financial institutions by satisfying all conditions or received a waiver, requisite documents fully executed, and draw-downs become permissible	New indicator included to track the number of IPPs that achieve financial close
Electricity supplied	No	Outcome	Total electricity supply	Megawatt hours	Total electricity, in megawatt hours, produced and/or imported in a year.	New indicator added	This is to gauge the quantity of power available to meet demand	New indicator included to measure the sum of gross electricity supplied during the year for all generating stations and imports
Quality of maintenance	No	Outcome	Power plant availability	Percentage	Unweighted average across all power plants of the following: total number of hours per quarter that a plant is able and available to produce electricity/Total number of hours in the same month	New indicator added	The objective of measuring availability is to gauge the quality of maintenance being carried out at the plant	Indicator introduce to measure the quality of maintenance being carried out at the plant
Capacity of energy sector organizations enhanced	No	Output	Number of advisory service days provided	Number	Number of advisory service days provided by MiDA and third-parties under contract on gas sector structuring and policy determination	New indicator added	Indicator of advisory services to ensure future ability to reform and sustain the gas sector.	Indicator to track the number of advisory service provided

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
	No	Output	Number of training participants	Number	Number of participants from organizations in the energy sector that participated in training to build their capacity	New indicator added	Measure the number of individuals benefiting directly from the program and allows us to track the inclusion of women in Ghana Power Compact II sponsored events.	New indicator to track individuals benefiting directly from training sessions from the Compact program
Energy Efficiency and Demand Side Management								
Increased energy savings as a result of street lighting	Yes	Outcome	Energy savings from upgraded streetlights	MWh	(1) Total MWh of energy saved due to new or upgraded street lighting in ECG Target Regions (2) Total kilowatt hours of energy saved due to new or upgraded street lighting in ECG Target Regions. Energy saved (kWh) = Energy consumption in kWh of existing lamps less new lamps	(1) The "result statement" and "indicator" name have been respectively revised as follows: • Increased energy savings, and • Energy savings from upgraded streetlights (2) The "unit of measure" has been changed from megawatt hours to kilowatt hours	The street lighting activity will be relying heavily on the use of energy saving street lamps and appropriate infrastructure for adequate illumination to reduce the lighting load at peak.	(1) It is preferable to have the cause of the outcome in the indicator name than in the result statement, which may be related to more than one indicator. For instance, increased energy savings may be caused by street lights activity as well as the standards and labels activity. (2) DQR recommendation
Increased energy savings	Yes	Outcome	Energy savings from "race to retrofit/ renewables"	kWh	Total kilowatts saved by the participating institutions in "race to retrofit"	Newly introduced indicator	The "race to retrofit" activity is targeted at eligible MMDAs to use more energy efficient appliances, which is expected to ultimately reduce power consumption	Introduced to comprehensively measure the effect of all the EEDSM activities.
Increased energy savings	Yes	Outcome	Energy savings from standards and labels	kWh	Total kilowatt hours of energy saved from the use of energy efficient appliances in place of high energy consuming appliances. Energy saved (kWh) = Energy consumption in kWh of existing appliances less new appliances, as measured by improved	Newly introduced indicator	To track over time the energy saved by the different energy efficient appliances with standards and labels developed as well as L.Is promulgated and enforced. Energy savings along each step of the process will be measured	Introduced to comprehensively measure the effect of all the EEDSM activities.

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
					energy meters (i.e. data loggers)			
	Yes	Outcome	Percentage of appliances compliant with standards	Percentage of targeted electrical appliances tested at the points of entry that demonstrate compliance with newly promulgated standards	Percentage of targeted electrical	Newly introduced indicator		
Demand profile improved and growth rate reduced	Yes	Output	Number of products with standards developed and passed	Number of products including electrical appliances with standards amended (for the existing standards) or promulgated (for new standards) by Parliament of Ghana to facilitate mandatory compliance	Number of standards on electrical appliances developed, with legislative instruments (LIs) amended (for the existing standards) or promulgated (for new standards) by Parliament of Ghana to facilitate mandatory compliance	Newly introduced indicator	Under the EE activity legislations on standards and labels for 17 new and 3 existing energy efficient appliances would be developed and upgraded respectively. This will involve several processes and institutions like EC, GSA, AG's Department and Parliament, thus will help track where challenges are in the process.	Promulgation of legislations on standards and labels can be very challenging and time-consuming since it will involve key institutions like AG's Department and Parliament, who the project has limited control over. Thus, it is necessary to measure to help identify which issues are slowing the process for timely resolution with the relevant Government of Ghana institution.
Demand profile improved and growth rate reduced	No	Output	Number of appliance test labs established	Number	Number of electrical appliance test labs constructed and commissioned/ functional	Newly introduced indicator	An AC Test Lab facility plus at most two additional Test Labs for other electrical appliances including electronics to be established.	A metric to track compliance at the points of entry will provide proxy indication of market penetration of the energy efficient appliances

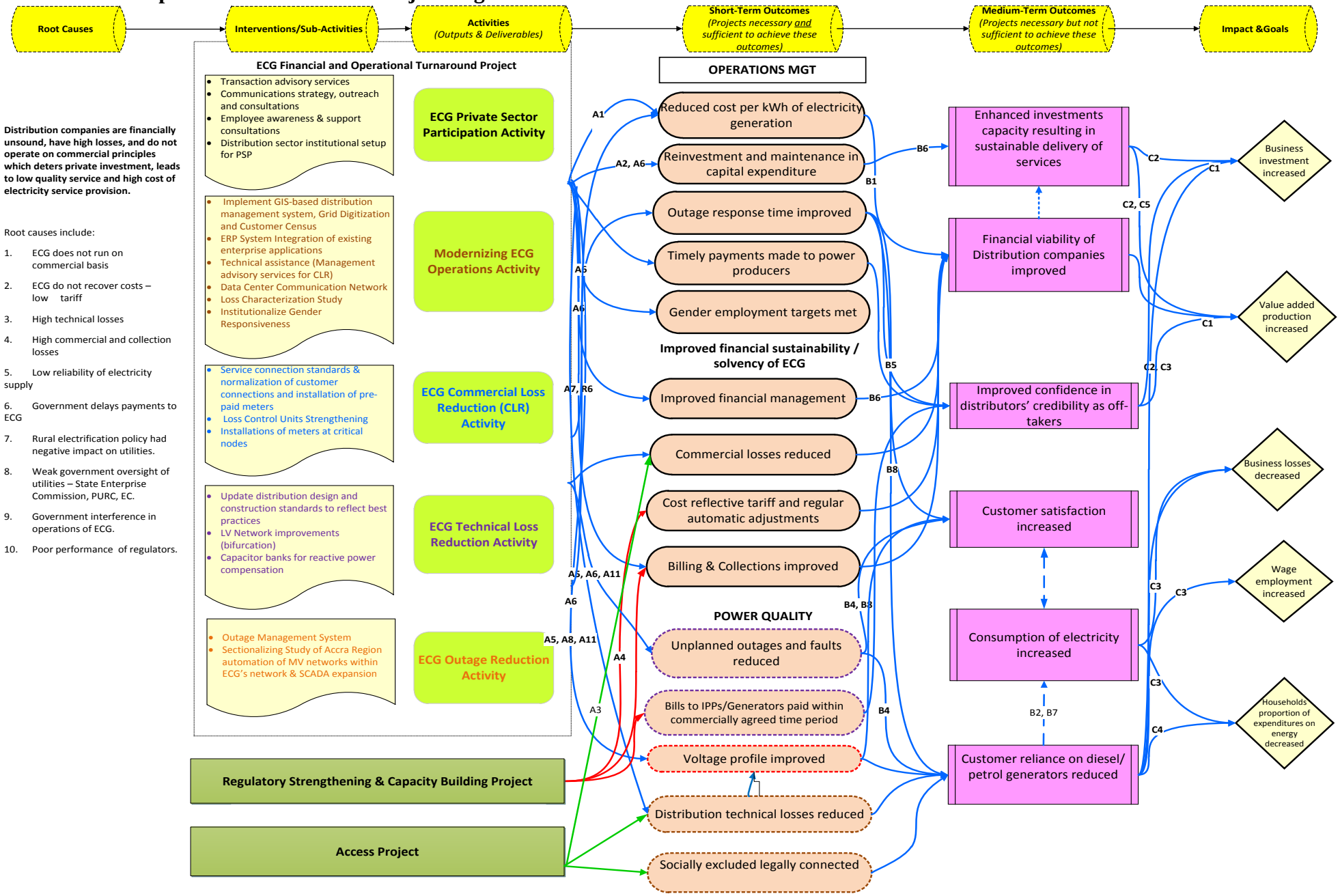
Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
Increased energy savings	No	Output	Number of institutions participating in "race to retrofit "	Number	Total number of institutions that benefit from Compact funds to implement the "race to retrofit/renewables" Program	Newly introduced indicator	The number of institutions in the "race to retrofit/renewables" will provide an indication of the level of commitment among the MDAs and MMDAs to reduce power consumption, in addition to assessing the likely impact of the activity.	Indicator introduced to help estimate the amount of energy saved prior to actual energy savings measurement. Also for the purposes of accountability to MCC
Increased energy savings	No	Output	Number of buildings retrofitted	Number	Total number of buildings with electrical installations and equipment retrofitted in participating institutions	Newly introduced indicator		The number of facilities that undergo retrofits will confirm the level of commitments of the MMDAs to reduce power consumption, in addition to assessing the likely impact of the activity.
Increased energy savings	No	Output	Number of energy audits	Number	Total number of energy audits conducted by trainees	Newly introduced indicator		To help track the immediate outcome of the auditing training
Increased energy savings	No	Output	Number of people trained in energy auditing	Number	Number of people trained and certified in energy auditing	Newly introduced indicator	The adequacy of trained and certified local energy auditors is expected to contribute to successful implementation of energy efficiency programs.	This indicator was introduced to measure the availability of human resource in the area of energy auditing in-country.
Increased public information, Education and communication on energy use efficiency	No	Output	Number of Public education campaigns	Number	Number of public education campaigns organized via different media platforms to disseminate information on energy efficiency.	Newly introduced indicator	It is assumed other EE/DSM indicators to facilitate public and private patronage of energy efficient appliances and give indications of sustainability of results.	This indicator was introduced to track the dollar amount of grants awarded to qualified institutions for the purposes of accountability to MCC and Government of Ghana.
Increased public information, Education and communication on energy use efficiency	No	Output	Number of students reached	Number	Total number of students from pilot pre-tertiary institutions using the curriculum	Newly introduced indicator	Incorporating energy efficient practices in pre-tertiary institutions will inculcate such habits in the future generations and ensure sustainability, even if the older generation is unable to do so.	Indicator introduced to help assess the timeliness in efforts to incorporate energy efficiency in the curricula of pre-tertiary institutions.

Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
Increased energy savings	No	Output	Number of energy saving streetlights	Number	Total number of energy saving bulbs/streetlights installed	Newly introduced indicator	With the introduction of more LED bulbs (and probably better technologies in the future) into the street lighting system, the load at peak will be shaved.	Indicator introduced to help estimate the energy savings to be realized from the construction of new or upgrade of existing street lamps with more energy efficient ones.
Process milestones achieved	No	Process	Value of signed power infrastructure feasibility and design contracts	USD	The value of all signed feasibility, design, and environmental impact assessment contracts, including resettlement action plans, for power infrastructure investments under EEDSM using 609 (g) and Compact funds.	Newly introduced indicator	To track the value of EEDSM infrastructure feasibility and design contracts	Indicator introduced to track the value of EEDSM infrastructure feasibility and design contracts for accountability purposes.
Process milestones achieved	No	Process	Value disbursed of power infrastructure feasibility and design contracts	US Dollars	The amount disbursed of all signed feasibility, design, and environmental impact assessment contracts, including resettlement action plans, for power infrastructure under EEDSM using 609(g) and compact funds.	Newly introduced indicator		To track funds disbursed under the EEDSM infrastructure feasibility and design studies contracts signed.
Process milestones achieved	No	Process	Percent disbursed of power infrastructure feasibility and design contracts	Percentage	The total amount of all signed feasibility, design, and environmental impact assessment contracts, including resettlement action plans, for power infrastructure under EEDSM disbursed divided by the total current value of signed contracts.	Newly introduced indicator	As a proxy to give an indication of how close the project is to delivering (i) a design for bidding documents and (ii) for works to commence	Indicator introduced as a proxy to give an indication of how close the project is in producing a deliverable – Feasibility Study reports and designs for preparation of bidding documents.
Process milestones achieved	No	Process	Value of signed power infrastructure construction contracts	USD	The value of all signed construction contracts for power infrastructure investments under EEDSM using Compact funds.	Newly introduced indicator	To track the value of DSM infrastructure construction contracts	Indicator introduced to track the value of DSM infrastructure construction contracts for accountability purposes.

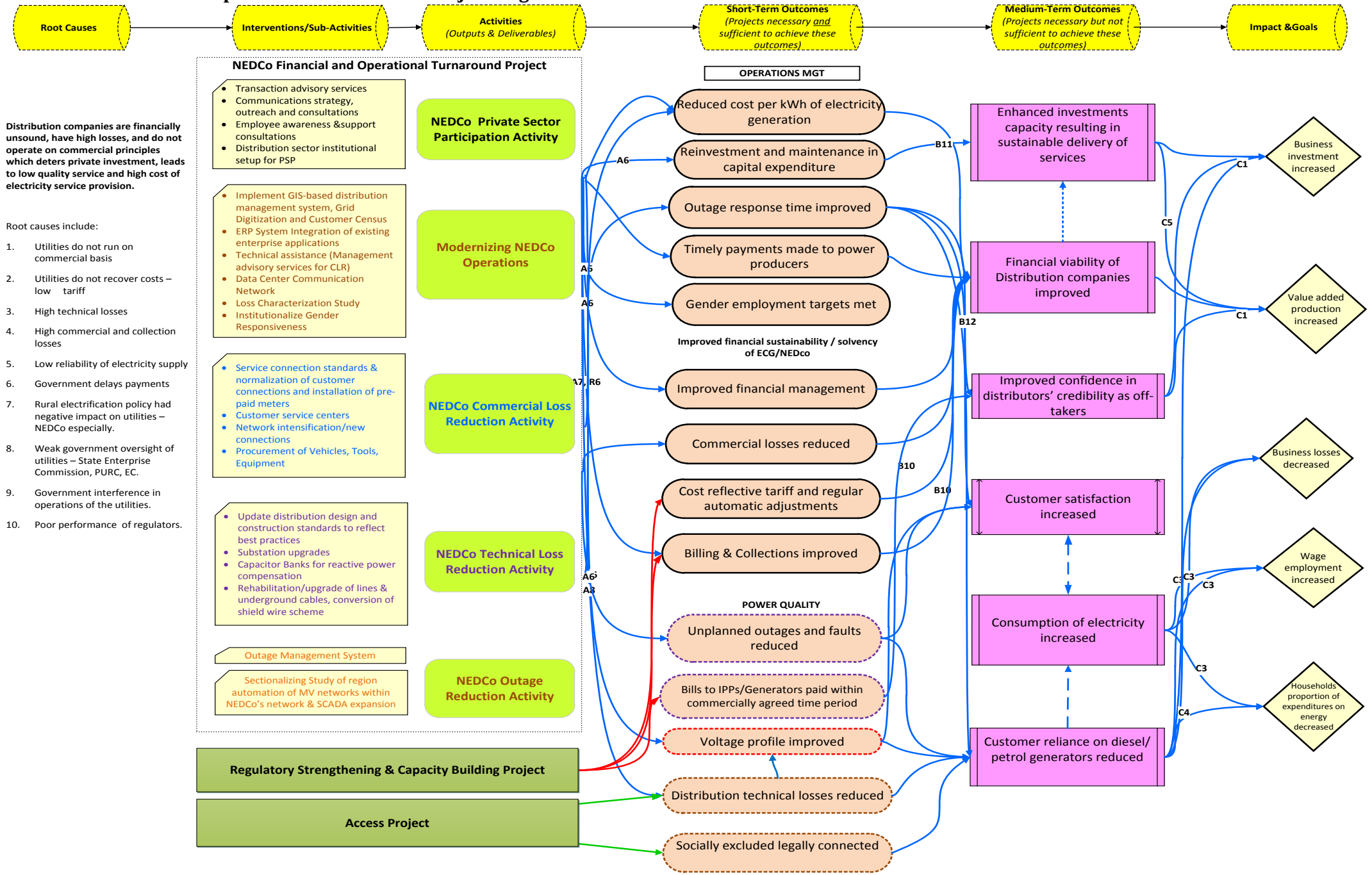
Result Statement	ERR linked	Level	Indicator	Unit	Definition	Modification	Original Assumptions & Rationale	Justification for Change
Process milestones achieved	No	Process	Value disbursed of power infrastructure construction contracts	USD	The amount disbursed of all signed construction contracts for power infrastructure investments under EEDSM using compact funds.	Newly introduced indicator		To track funds disbursed under the EEDSM infrastructure construction (works) contract signed.
Process milestones achieved	No	Process	Percent disbursed of power infrastructure construction contracts	Percentage	The total amount of all signed construction contracts for power infrastructure investments under EEDSM disbursed divided by the total current value of all signed contracts.	Newly introduced indicator	As a proxy to give an indication of how close the project is in delivering its tangible product or output.	Indicator introduced as a proxy to give an indication of how close the project is in delivering a tangible product or output, which at times may take some time to achieve.
Process milestones achieved	No	Process	Temporary employment generated in power infrastructure projects	Number	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 under EEDSM.	Newly introduced indicator	It is assumed that the DSM infrastructure construction projects will generate income, mostly for Ghanaians and between the gender divide	Indicator introduced to track the number of people, especially Ghanaians, who have gained employment under the DSM infrastructure projects. That is to measure the extent of job creation by the Compact.

ADDITIONAL ANNEXES: PROJECT LOGICS

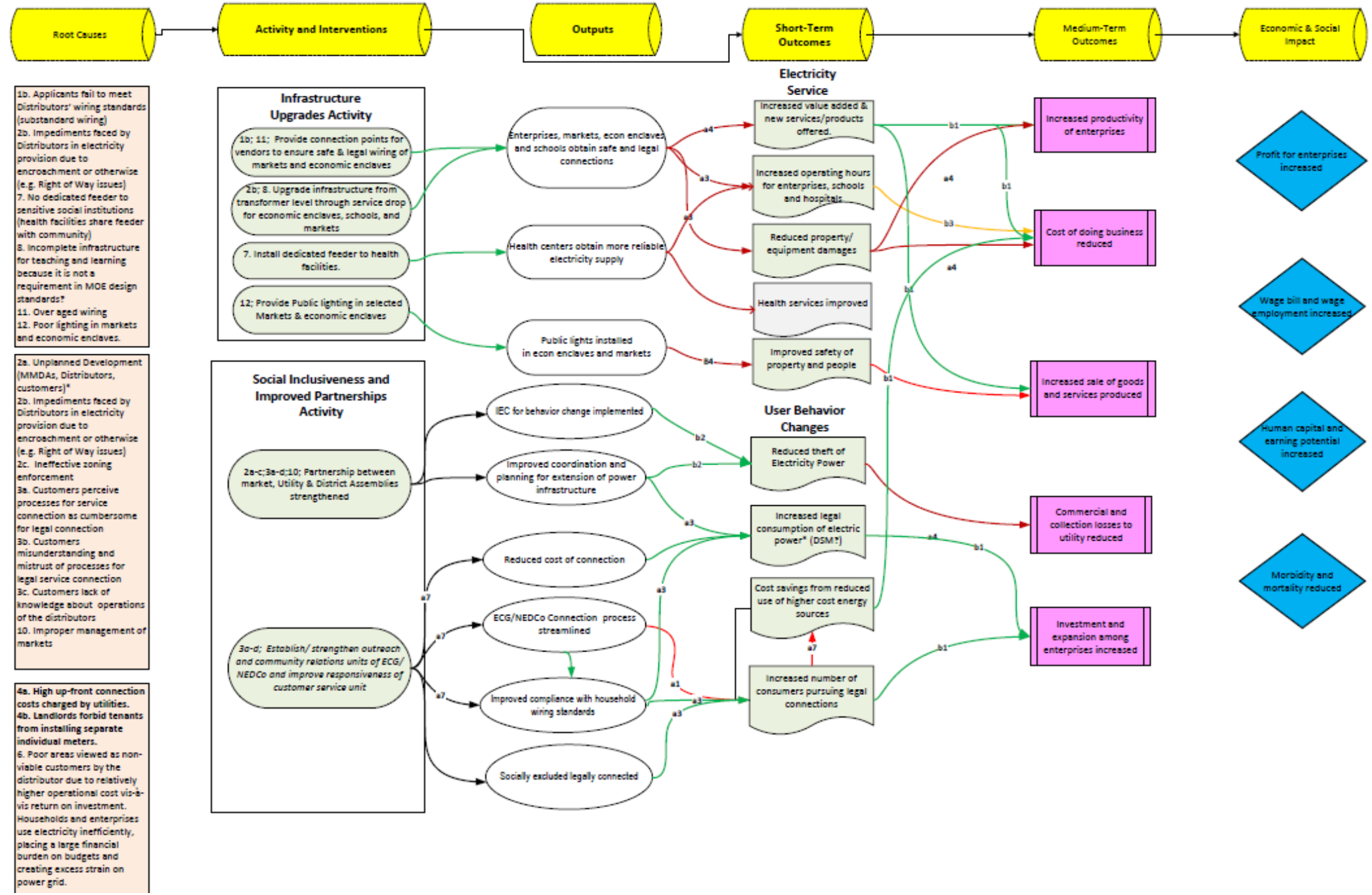
ECG Financial and Operational turnaround Project Logic



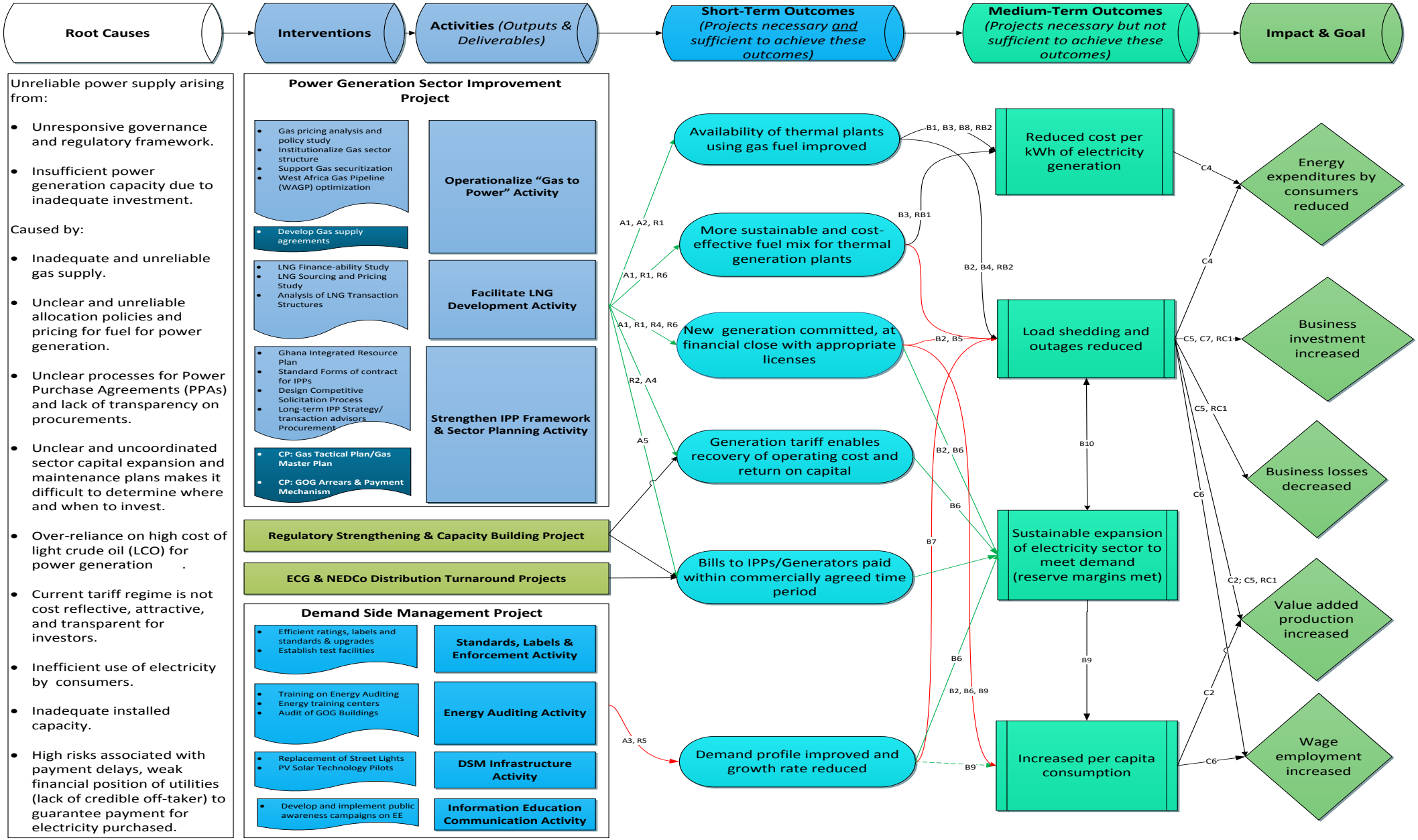
NEDCO Financial and Operational turnaround Project Logic



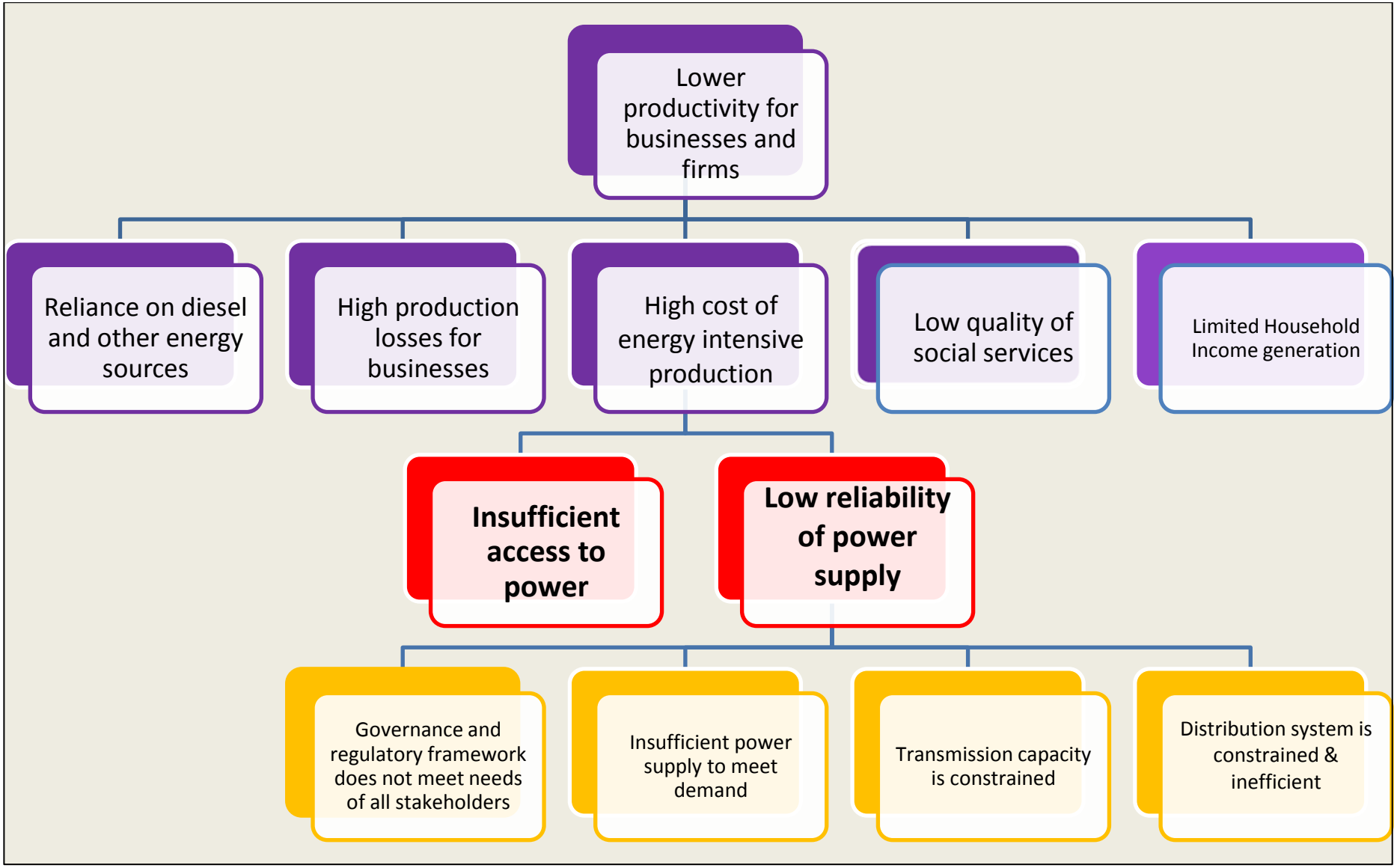
Access Project Logic



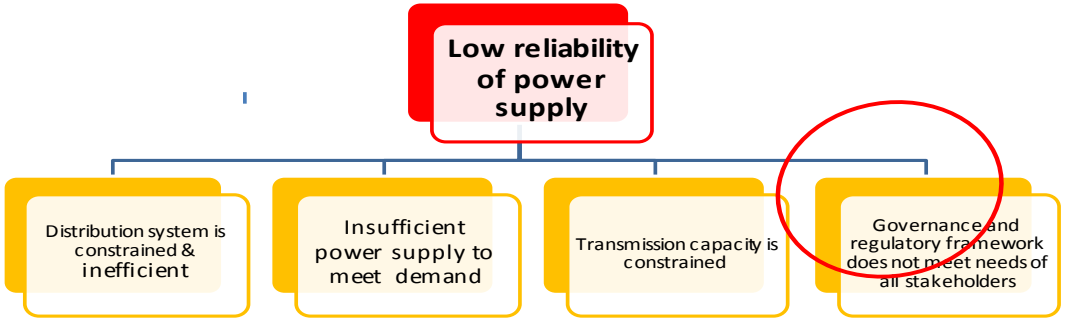
Power Generation & DSM/EE Project Logic



ADDITIONAL ANNEXES: PROBLEM TREE

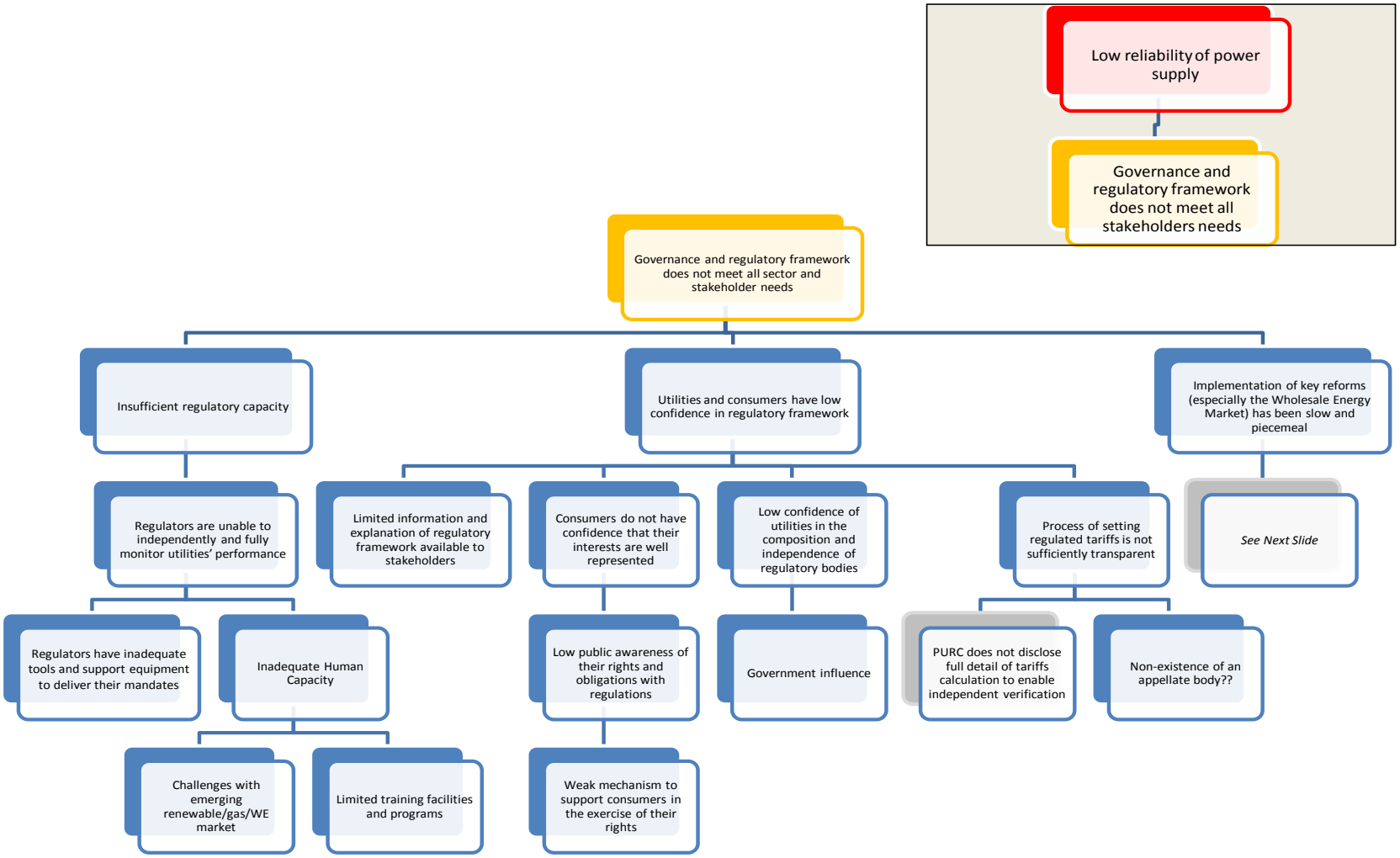


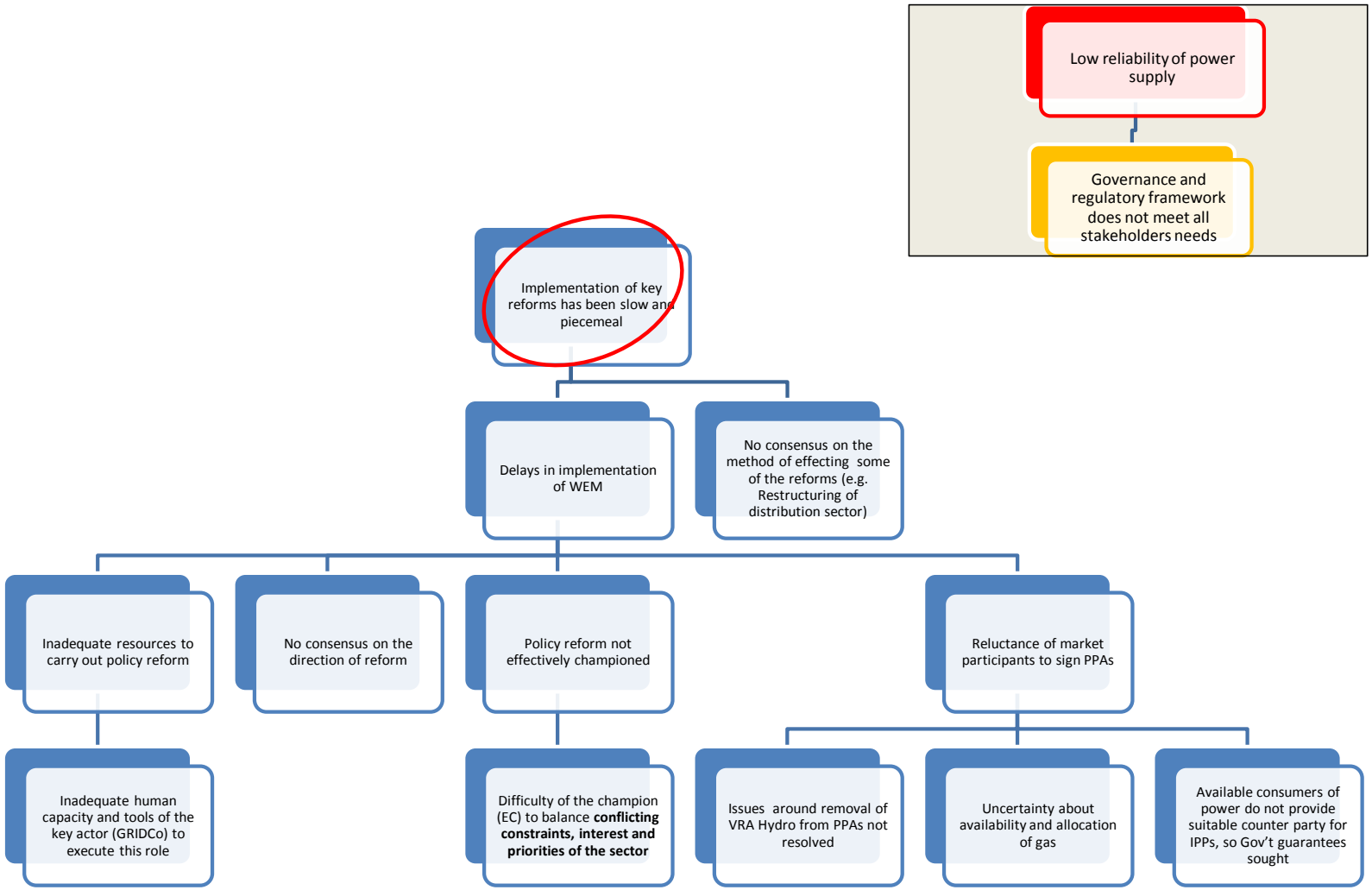
1a.



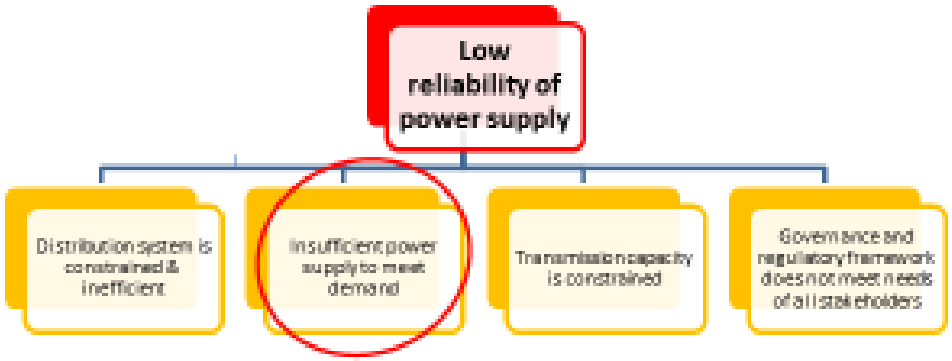
Ghana Power Sector Problem Tree Node:

"THE GOVERNANCE & REGULATORY FRAMEWORK DOES NOT MEET THE NEEDS OF ALL STAKEHOLDERS"


Low reliability of power supply
Governance and regulatory framework does not meet all stakeholders needs
Governance and regulatory framework does not meet all sector and stakeholder needs
Insufficient regulatory capacity
Utilities and consumers have low confidence in regulatory framework
Implementation of key reforms (especially the Wholesale Energy Market) has been slow and piecemeal
Regulators are unable to independently and fully monitor utilities' performance
Limited information and explanation of regulatory framework available to stakeholders
Consumers do not have confidence that their interests are well represented
Low confidence of utilities in the composition and independence of regulatory bodies
Process of setting regulated tariffs is not sufficiently transparent
See Next Slide
Regulators have inadequate tools and support equipment to deliver their mandates
Inadequate Human Capacity
Low public awareness of their rights and obligations with regulations
Government influence
PURC does not disclose full detail of tariffs calculation to enable independent verification
Non-existence of an appellate body??
Challenges with emerging renewable/gas/WE market
Limited training facilities and programs
Weak mechanism to support consumers in the exercise of their rights

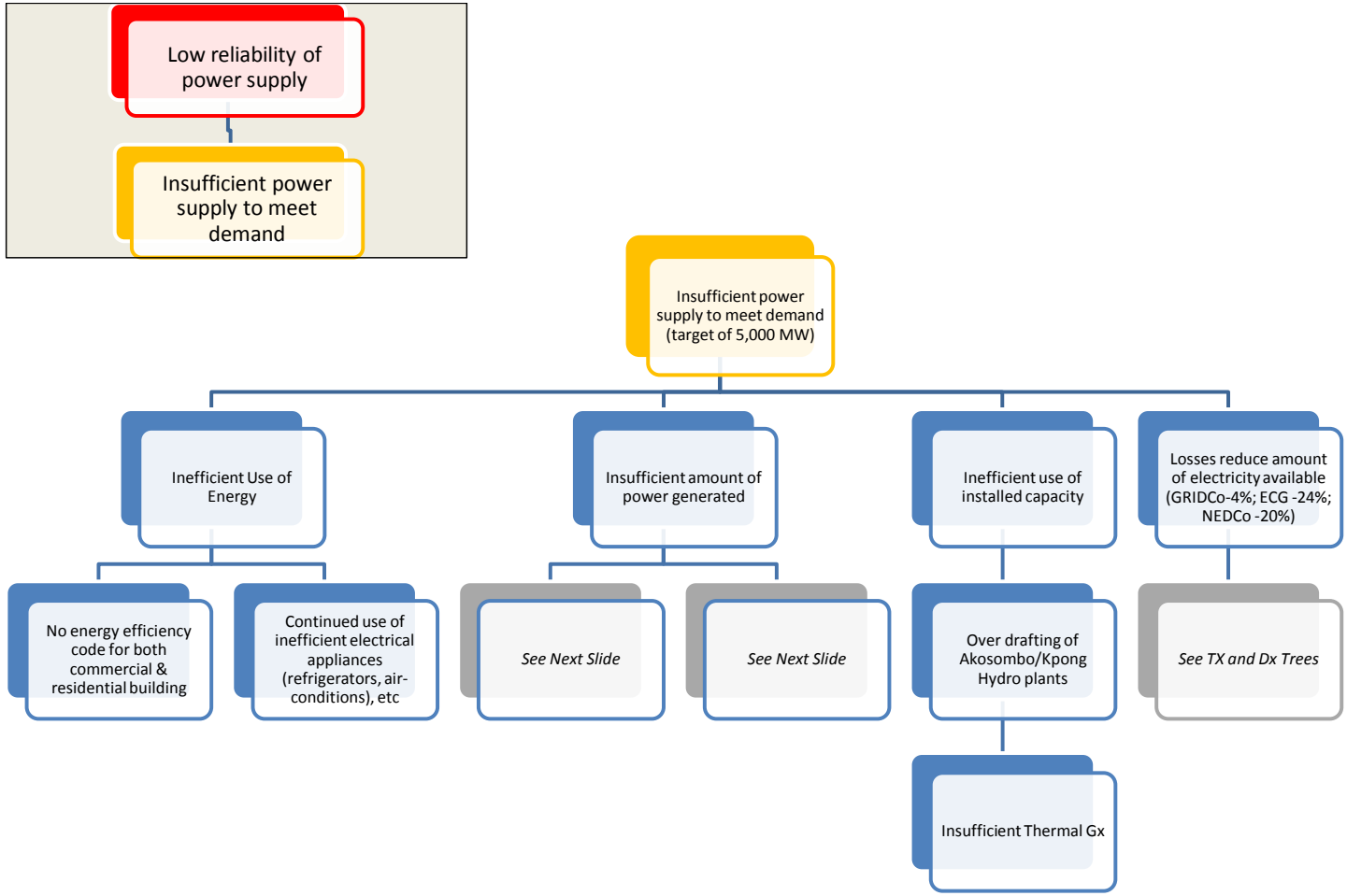

Low reliability of power supply
Governance and regulatory framework does not meet all stakeholders needs
Implementation of key reforms has been slow and piecemeal
Delays in implementation of WEM
No consensus on the method of effecting some of the reforms (e.g. Restructuring of distribution sector)
Inadequate resources to carry out policy reform
No consensus on the direction of reform
Policy reform not effectively championed
Reluctance of market participants to sign PPAs
Inadequate human capacity and tools of the key actor (GRIDCo) to execute this role
Difficulty of the champion (EC) to balance conflicting constraints, interest and priorities of the sector
Issues around removal of VRA Hydro from PPAs not resolved
Uncertainty about availability and allocation of gas
Available consumers of power do not provide suitable counter party for IPPs, so Gov't guarantees sought

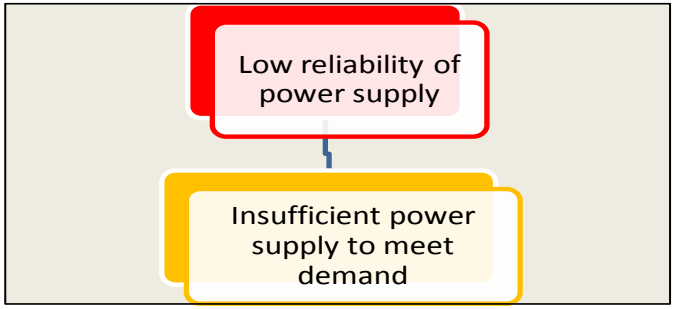
1b.

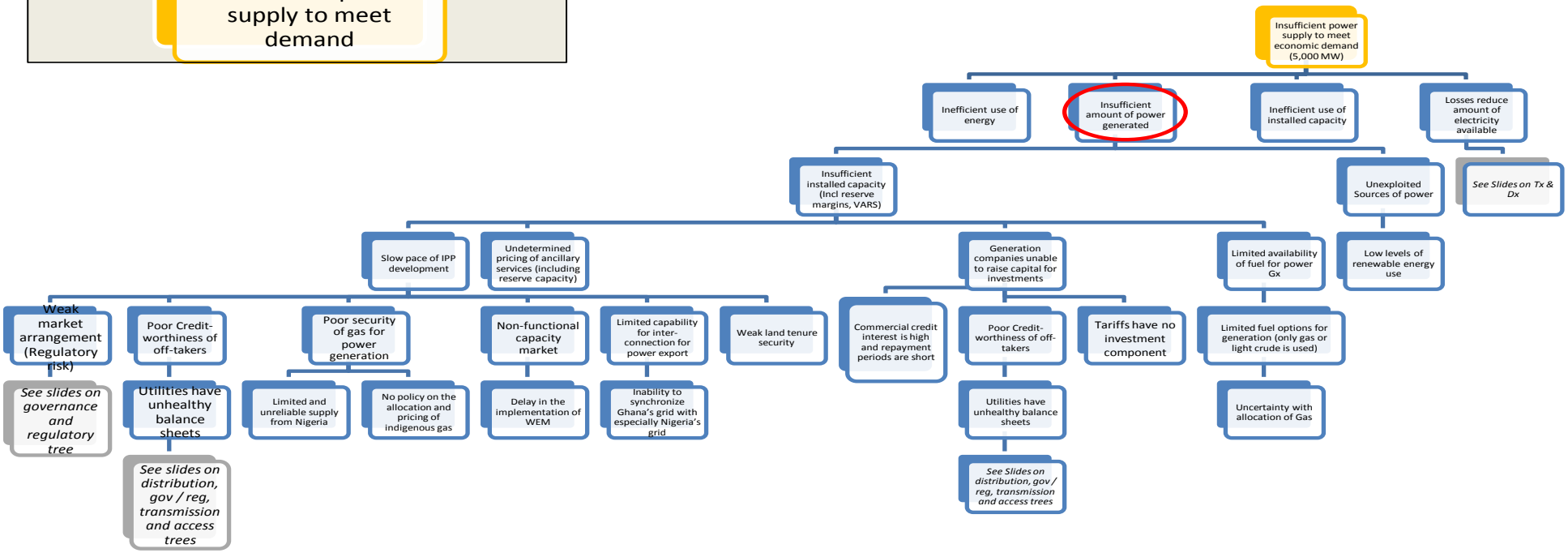


Ghana Power Sector Problem Tree Node:

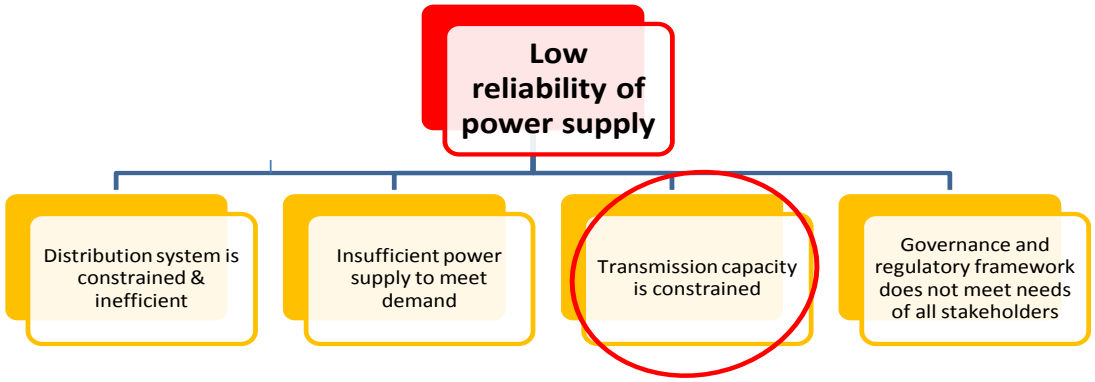
"INSUFFICIENT POWER SUPPLY TO MEET ECONOMIC DEMAND"


Low reliability of power supply
Insufficient power supply to meet demand
Insufficient power supply to meet demand (target of 5,000 MW)
Inefficient Use of Energy
Insufficient amount of power generated
Inefficient use of installed capacity
Losses reduce amount of electricity available (GRIDCo-4%; ECG -24%; NEDCo -20%)
No energy efficiency code for both commercial & residential building
Continued use of inefficient electrical appliances (refrigerators, air-conditions), etc
See Next Slide
See Next Slide
Over drafting of Akosombo/Kpong Hydro plants
See TX and Dx Trees
Insufficient Thermal Gx


Low reliability of power supply
Insufficient power supply to meet demand

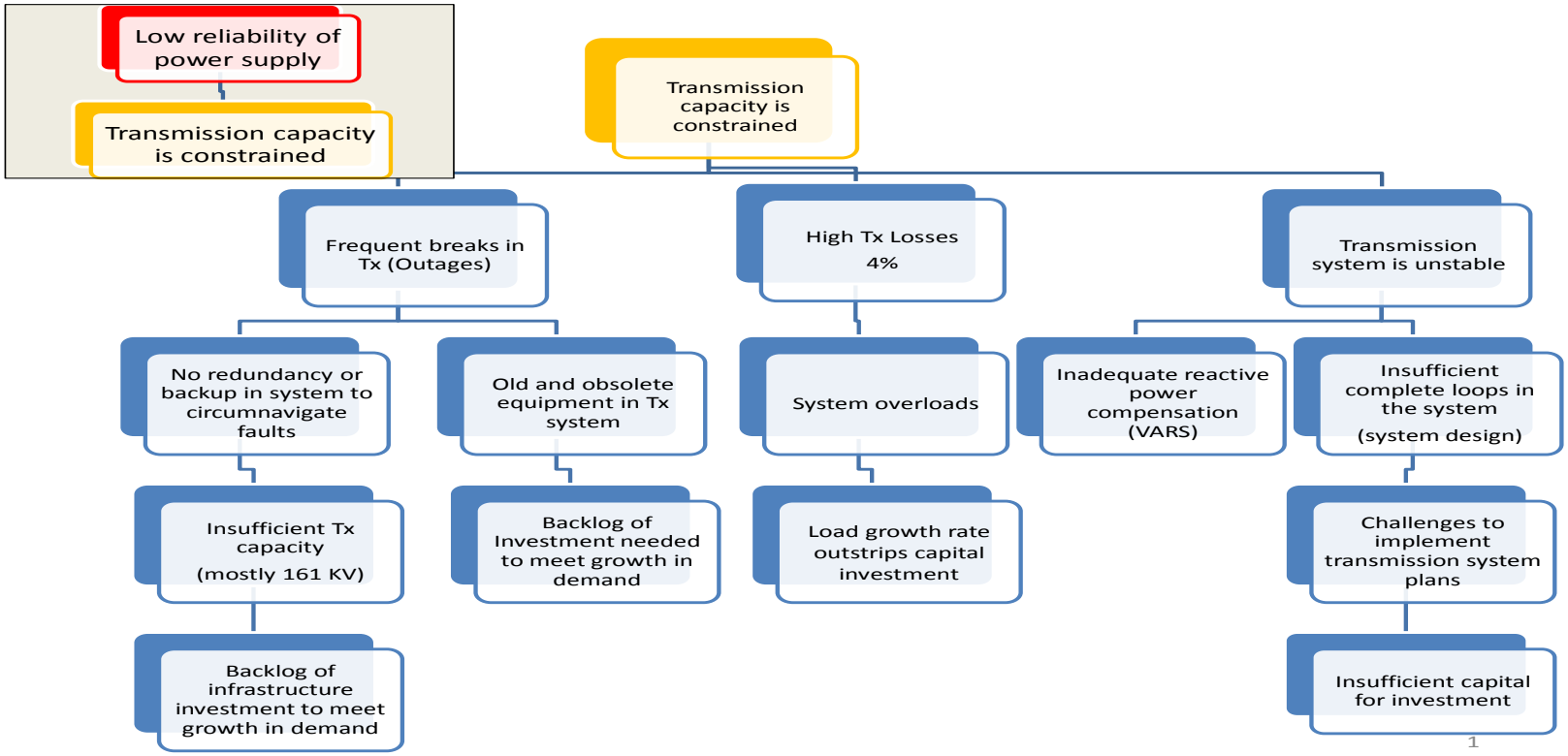

Insufficient power supply to meet economic demand (5,000 MW)
Inefficient use of energy
Insufficient amount of power generated
Inefficient use of installed capacity
Losses reduce amount of electricity available
Insufficient installed capacity (Incl reserve margins, VARS)
Unexploited Sources of power
See Slides on Tx & Dx
Slow pace of IPP development
Undetermined pricing of ancillary services (including reserve capacity)
Generation companies unable to raise capital for investments
Limited availability of fuel for power Gx
Low levels of renewable energy use
Weak market arrangement (Regulatory risk)
Poor Credit-worthiness of off-takers
Poor security of gas for power generation
Non-functional capacity market
Limited capability for inter-connection for power export
Weak land tenure security
Commercial credit interest is high and repayment periods are short
Poor Credit-worthiness of off-takers
Tariffs have no investment component
Limited fuel options for generation (only gas or light crude is used)
See slides on governance and regulatory tree
Utilities have unhealthy balance sheets
Limited and unreliable supply from Nigeria
No policy on the allocation and pricing of indigenous gas
Delay in the implementation of WEM
Inability to synchronize Ghana's grid with especially Nigeria's grid
Utilities have unhealthy balance sheets
Uncertainty with allocation of Gas
See slides on distribution, gov / reg, transmission and access trees
See Slides on distribution, gov / reg, transmission and access trees

1c.

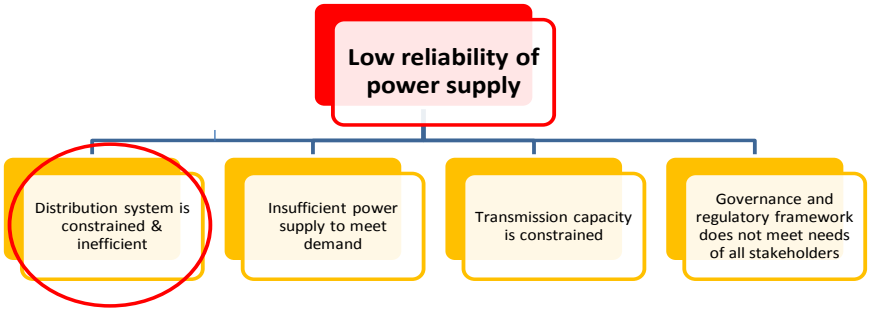


Ghana Power Sector Problem Tree Node:

"TRANSMISSION CAPACITY IS CONSTRAINED"

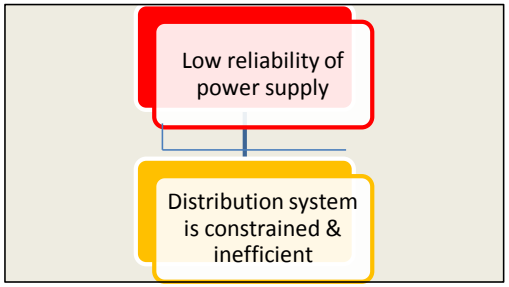

Low reliability of power supply
Transmission capacity is constrained
Transmission capacity is constrained
Frequent breaks in Tx (Outages)
High Tx Losses 4%
Transmission system is unstable
No redundancy or backup in system to circumnavigate faults
Old and obsolete equipment in Tx system
System overloads
Inadequate reactive power compensation (VARS)
Insufficient complete loops in the system (system design)
Insufficient Tx capacity (mostly 161 KV)
Backlog of Investment needed to meet growth in demand
Load growth rate outstrips capital investment
Challenges to implement transmission system plans
Backlog of infrastructure investment to meet growth in demand
Insufficient capital for investment
1

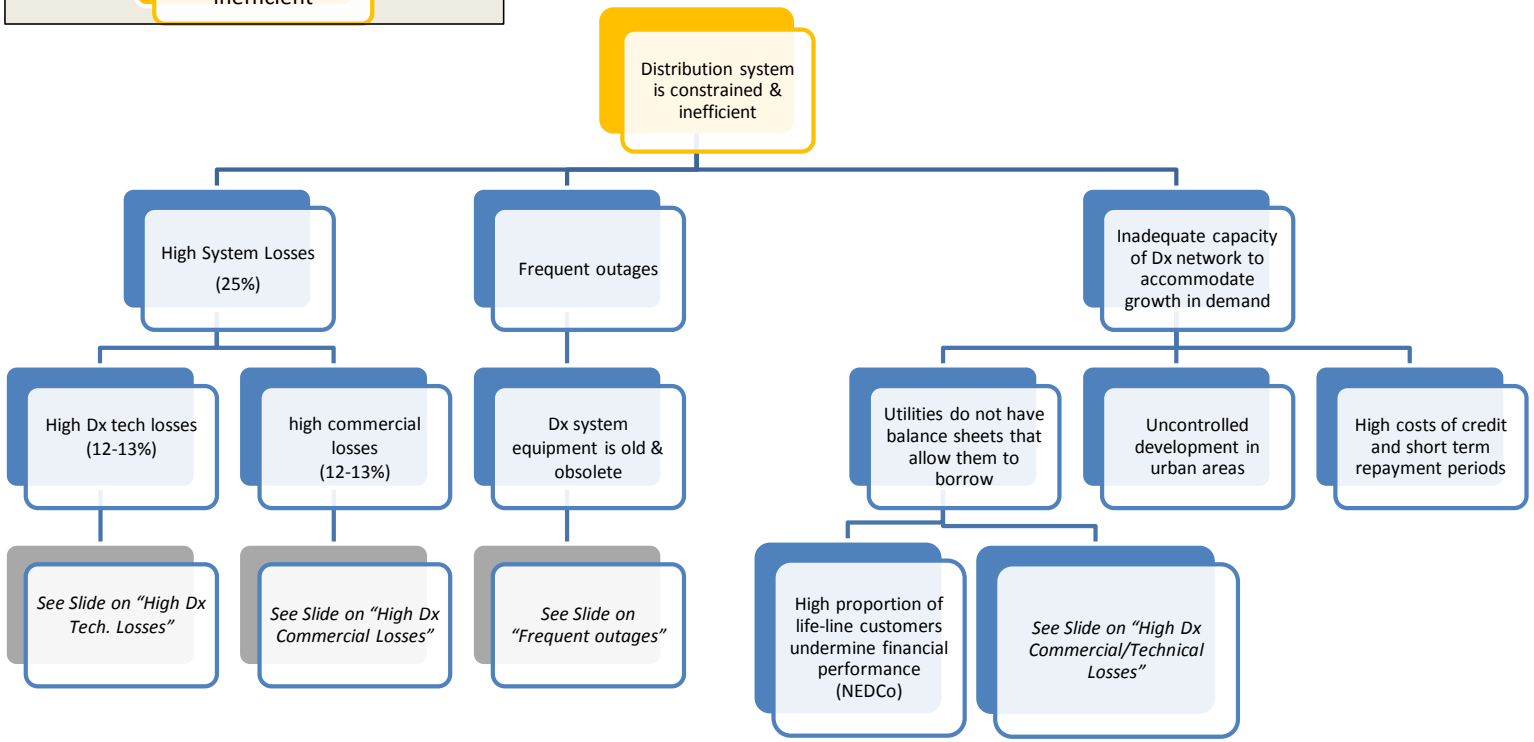
1d.

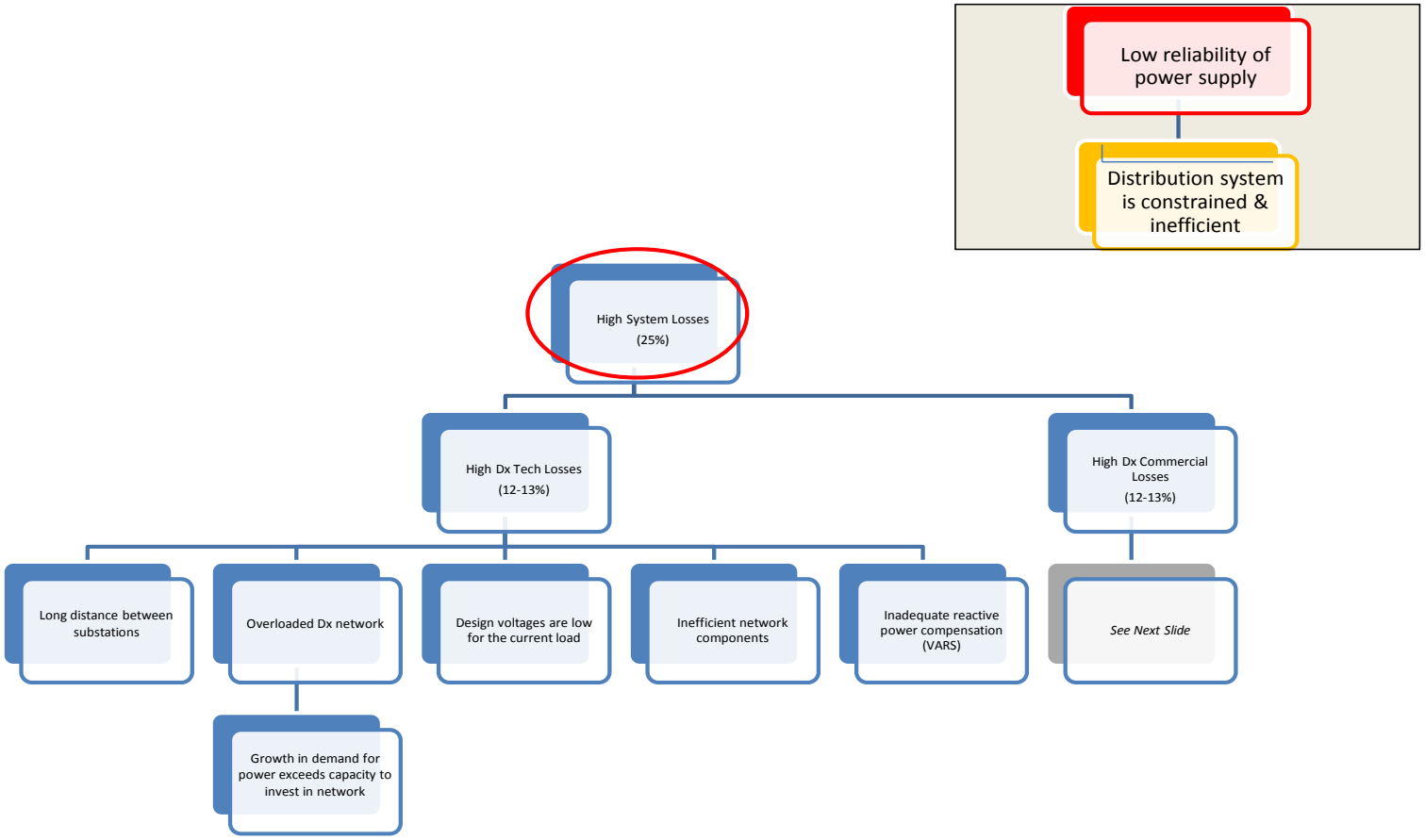


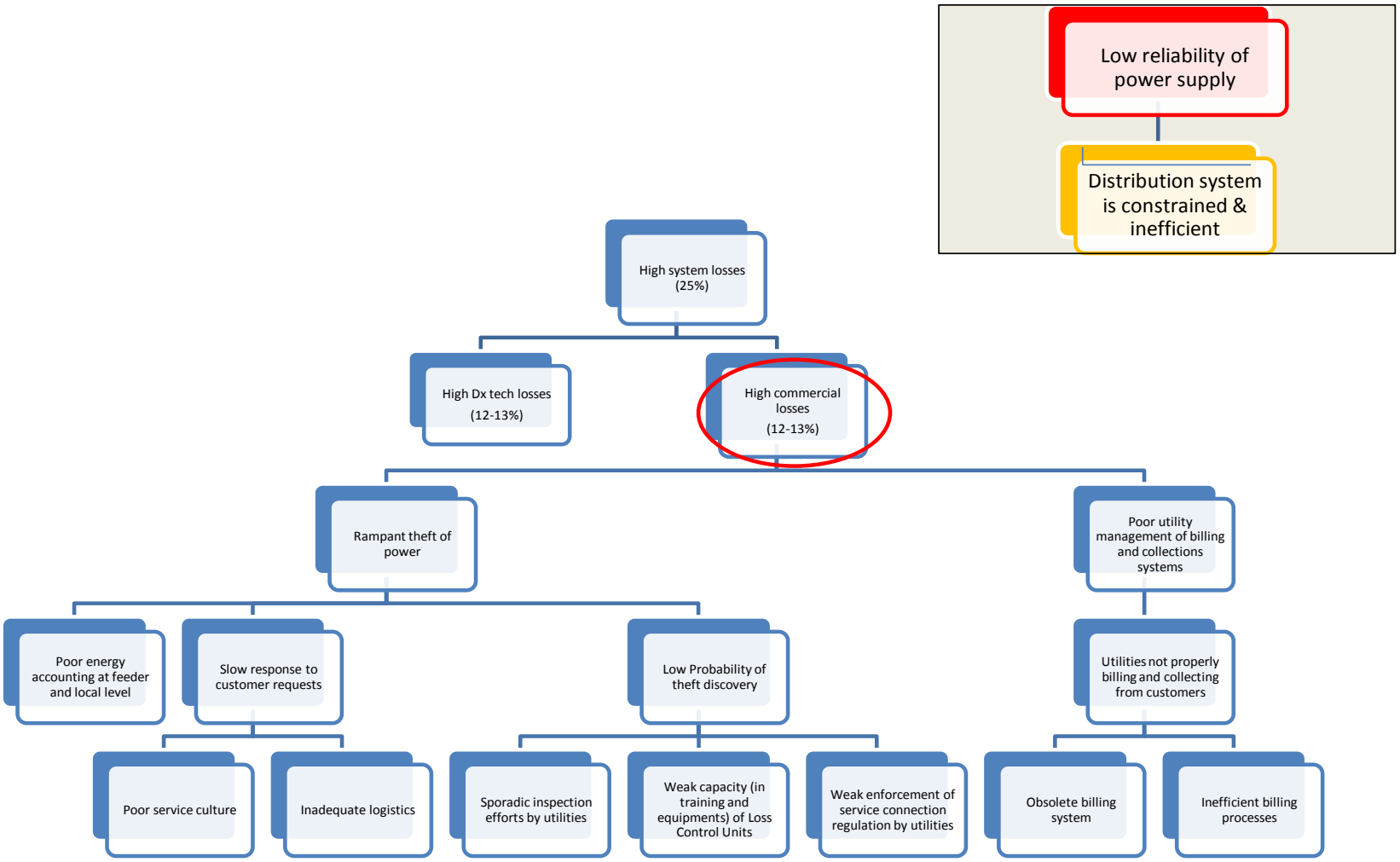
Ghana Power Sector Problem Tree Node:

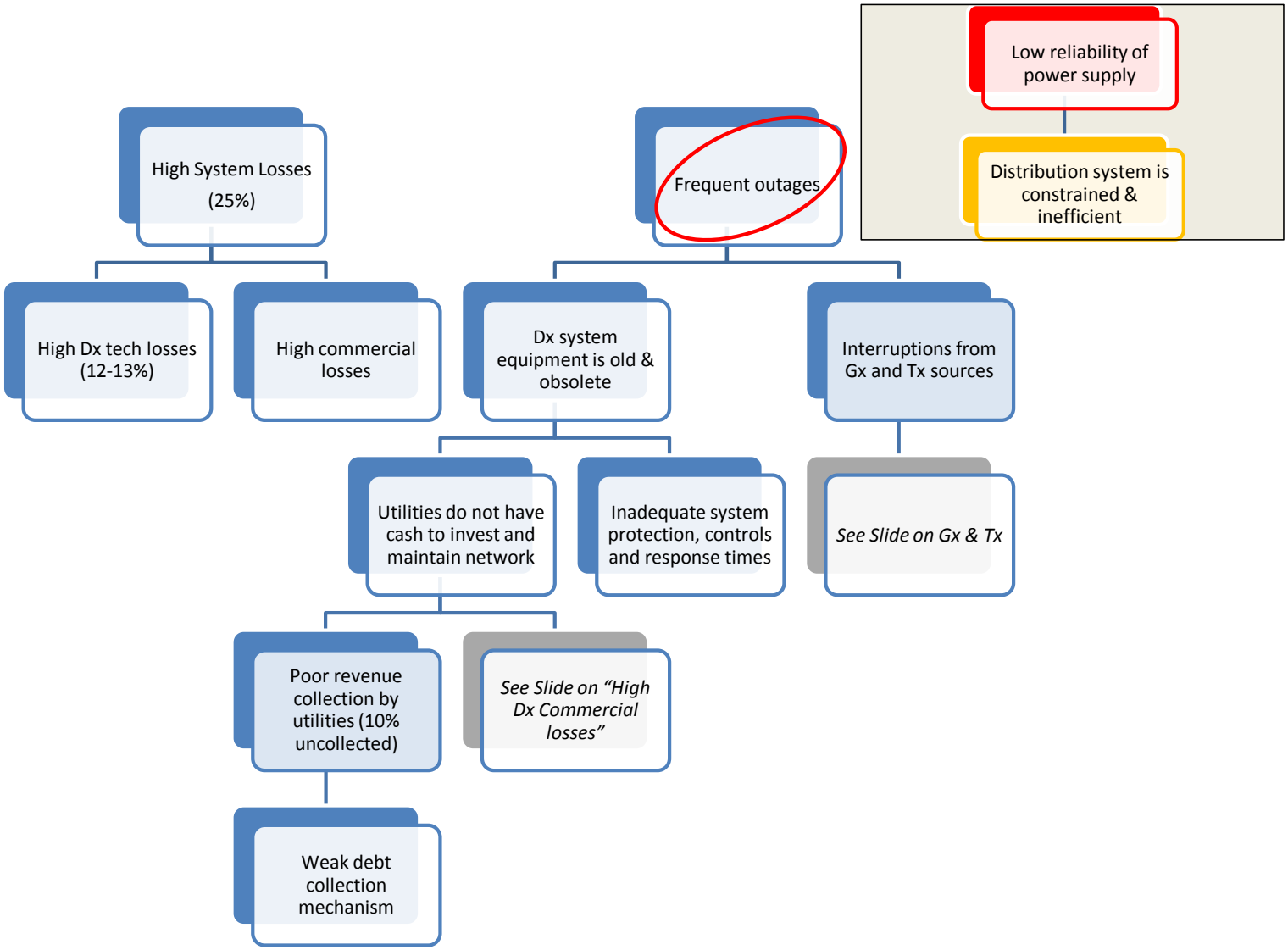
"DISTRIBUTION SYSTEM IS CONSTRAINED AND INEFFICIENT"


Low reliability of power supply
Distribution system is constrained & inefficient

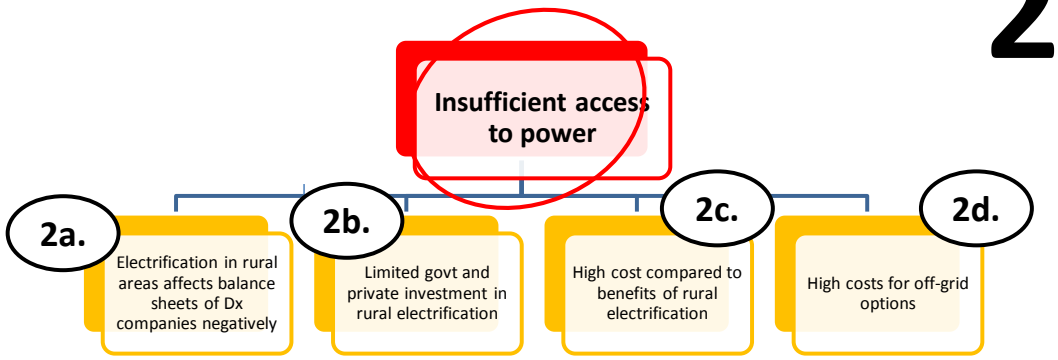

Distribution system is constrained & inefficient
High System Losses (25%)
Frequent outages
Inadequate capacity of Dx network to accommodate growth in demand
High Dx tech losses (12-13%)
high commercial losses (12-13%)
Dx system equipment is old & obsolete
Utilities do not have balance sheets that allow them to borrow
Uncontrolled development in urban areas
High costs of credit and short term repayment periods
See Slide on "High Dx Tech. Losses"
See Slide on "High Dx Commercial Losses"
See Slide on "Frequent outages"
High proportion of life-line customers undermine financial performance (NEDCo)
See Slide on "High Dx Commercial/Technical Losses"


Low reliability of power supply
Distribution system is constrained & inefficient
High System Losses (25%)
High Dx Tech Losses (12-13%)
High Dx Commercial Losses (12-13%)
Long distance between substations
Overloaded Dx network
Design voltages are low for the current load
Inefficient network components
Inadequate reactive power compensation (VARS)
See Next Slide
Growth in demand for power exceeds capacity to invest in network


Low reliability of power supply
Distribution system is constrained & inefficient
High system losses (25%)
High Dx tech losses (12-13%)
High commercial losses (12-13%)
Rampant theft of power
Poor utility management of billing and collections systems
Poor energy accounting at feeder and local level
Slow response to customer requests
Low Probability of theft discovery
Utilities not properly billing and collecting from customers
Poor service culture
Inadequate logistics
Sporadic inspection efforts by utilities
Weak capacity (in training and equipments) of Loss Control Units
Weak enforcement of service connection regulation by utilities
Obsolete billing system
Inefficient billing processes

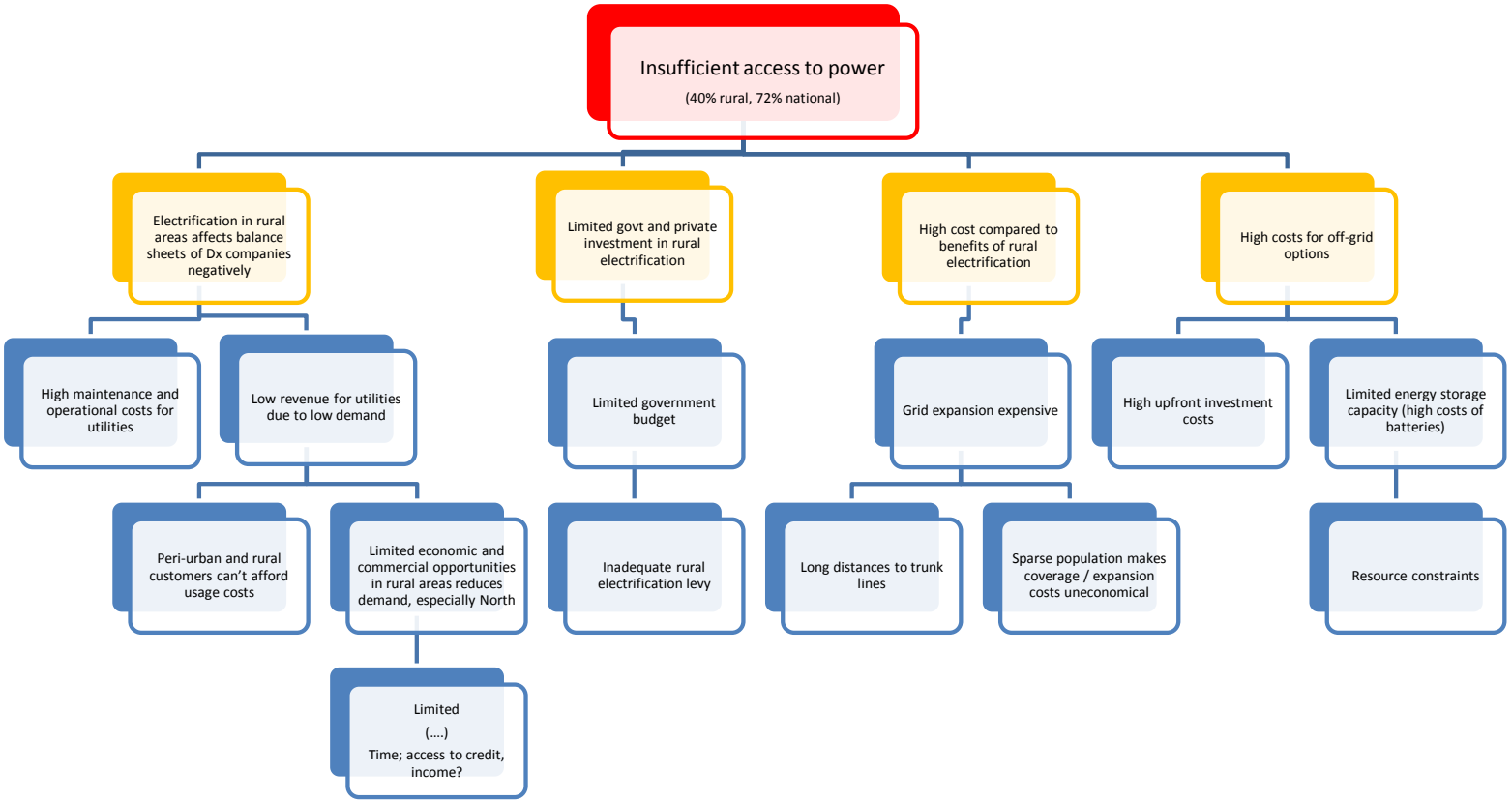

High System Losses (25%)
Frequent outages
Low reliability of power supply
Distribution system is constrained & inefficient
High Dx tech losses (12-13%)
High commercial losses
Dx system equipment is old & obsolete
Interruptions from Gx and Tx sources
Utilities do not have cash to invest and maintain network
Inadequate system protection, controls and response times
See Slide on Gx & Tx
Poor revenue collection by utilities (10% uncollected)
See Slide on "High Dx Commercial losses"
Weak debt collection mechanism

2.



Ghana Power Sector Problem Tree Node:

"INSUFFICIENT ACCESS TO POWER"


Insufficient access to power
(40% rural, 72% national)
Electrification in rural areas affects balance sheets of Dx companies negatively
Limited govt and private investment in rural electrification
High cost compared to benefits of rural electrification
High costs for off-grid options
High maintenance and operational costs for utilities
Low revenue for utilities due to low demand
Limited government budget
Grid expansion expensive
High upfront investment costs
Limited energy storage capacity (high costs of batteries)
Peri-urban and rural customers can't afford usage costs
Limited economic and commercial opportunities in rural areas reduces demand, especially North
Inadequate rural electrification levy
Long distances to trunk lines
Sparse population makes coverage / expansion costs uneconomical
Resource constraints
Limited
(....)
Time; access to credit, income?