

# GHANA MILLENNIUM CHALLENGE ACCOUNT PROGRAM

## COMPACT II



*Powering Ghana for Accelerated and Sustainable Economic Growth*

**INCREASING PRIVATE SECTOR INVESTMENT  
THROUGH IMPROVED FISCAL POSITION OF GOG AND  
IMPROVED FINANCIAL PERFORMANCE OF UTILITIES  
IN THE ELECTRICITY SECTOR**

## CONCEPT PAPER

(PROJECTS 1, 2A, 2B, 3)

**SUBMITTED TO**

**MILLENNIUM CHALLENGE CORPORATION**

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## **ABBREVIATIONS**

AMR	Automatic Meter Reading
ECG	Electricity Company of Ghana
Gh¢	Ghana Cedi
GIS	Geographic Information System
GOG	Government of Ghana
IPP	Independent Power Producer
MDA	Ministries, Departments and Agencies (Government Institutions)
NEDCo	Northern Electricity Distribution Company
PURC	Public Utilities Regulatory Commission
VRA	Volta River Authority

# 1 Project Rationale and Description

## 1.1 Problem/ Constraint Statement

### 1.1.1 The Power Sector Problem Tree

A problem tree analysis method was used to identify and define the problems confronting the power sector in Ghana. The Power Sector Problem Tree was developed between January and March 2012 by the Core Team in consultation with Focal Persons from the power sector agencies, technical advisors, and MCC counterparts. The analysis identified a number of financial performance issues under five Key Nodes. The detailed problem tree is provided in the appendices, but the issues relating to financial performance are summarised below:

Key Node	Financial Performance root causes and related sub-problems
‘Governance and Regulatory Framework does not meet needs of all Stakeholders’	<ul style="list-style-type: none"> <li>• Process of setting regulated tariffs is not sufficiently transparent</li> </ul>
“Insufficient power supply to meet economic demand”	<ul style="list-style-type: none"> <li>• Credit worthiness of off-takers</li> <li>• Tariffs have no investment component</li> <li>• Utilities have unhealthy balance sheets</li> </ul>
“Transmission capacity is constrained”	<ul style="list-style-type: none"> <li>• Insufficient capital for investment</li> </ul>
“Distribution system is constrained and inefficient”	<ul style="list-style-type: none"> <li>• Poor utility management of billing and collections systems</li> <li>• Utilities do not have balance sheets that allow them to borrow</li> </ul>
“Insufficient Access To Power”	<ul style="list-style-type: none"> <li>• High maintenance and operational costs for utilities</li> <li>• Low revenue for utilities due to low demand</li> <li>• Limited government budget</li> <li>• Grid expansion expensive</li> <li>• High upfront investment costs</li> </ul>

The root causes, problems and sub-problems identified in the Problem Tree will be addressed under three broad headings with the view to realising full cost recovery, namely:

- Instituting a Cost-reflective tariff regime,
- Elimination of commercial losses
- Improvement of revenue collection rates

The issues in this paper are linked to issues raised in the Concept paper on Distribution and Increasing Private Sector Investment Through Power Sector Reform.

. This paper however seeks to highlight the ‘softer’ issues, and financial ‘performance drivers’ surrounding proposals to improve fiscal and financial oversight of the sector and

direct financial improvements in the selected pilot areas of Tamale and Tema. The proposed areas for improvement are reinvigorating fiscal oversight of the sector by improving the capacity of the regulators and instituting robust financial management and performance controls in the pilot areas to reduce hidden costs within the sector.

### *1.1.2 Hidden Costs*

The most pressing financial challenges facing the institutions in Ghana's electricity sector are three fold; high losses (technical and commercial), non-payment of bills, and tariffs set below cost-recovery rates. These challenges are compounded by rapid growth in customer demand and the increasing dependence on the more costly oil based thermal generation since hydro generation capacity is insufficient and periodic hydrological shortfalls further reduce hydro generation capacity. The increased generation costs associated with more costly thermal generation are however not fully passed on to consumers, because the mechanisms for automatically adjusting tariffs are not applied or are overridden.

The World bank research paper by Jane O. Ebinger, highlights the fact that in such situations, utilities typically reduce investment in maintenance; delay or forego essential maintenance and repairs; or reduce the workforce, actions that trigger a downward spiral of significant deterioration in the value of assets, declining service quality, and increasing cost for each unit of service provided. When this happens, losses are increased substantially and abnormally high investment is required to carry out repairs, which is rarely cost effective<sup>1</sup>.

Since these costs are generally not recorded, the utilities are not fully aware of the quantum of costs they are absorbing on behalf of the government, and these costs are thus termed as "**hidden costs**". These hidden costs are in effect a subsidy to the consumer which cannot be sustained ad infinitum by the Utility entities.

Hidden costs weaken the financial positions of the utilities, and this weak financial position of the utilities is a major constraint to them being able to upgrade their systems and enter into partnership with Independent Power Producers (IPPs).

The draft report of the study commissioned by the MoEn under the Ghana Energy Development and Access Project (GEDAP)<sup>2</sup>, prepared by Messrs Global Energy Consulting Engineers on Technical and Commercial Losses occurring within the distributions systems of the ECG and VRA/NEDCo also identifies technical, commercial and collection hidden costs. This study identifies the commercial and collection losses separately. Commercial loss is calculate as the average price of revenue billed per kWh in GHC i.e (Total Revenue billed in MGHC / Energy sales in GWH). In this study, 70 % of the commercial loss reduction is taken as additional energy sales and balance 30% as energy savings by customer.

It is envisaged that under the compact, the Hidden Costs Calculator model designed by J.O. Erbinger may be used to provide insight into three key components that affect

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<sup>1</sup> Measuring Financial Performance in Infrastructure: An Application to Europe and Central Asia Jane O. Ebinger

<sup>2</sup> National Technical and Commercial Loss Study for ECG & VRA/NED, Ghana by Global Energy Consulting Engineers, India

infrastructure: poor bill collection rates; excessive losses due to inefficient operations or theft from the network in power systems; and tariffs set below cost-recovery rates (i.e., amounts needed for long-run operations and maintenance, investment, and normative losses). Alternatively, the methodology used in the GEDAP Loss study report could be used for benchmarking and monitoring and evaluation.

Hidden costs will therefore be a key metric for monitoring over the project period to ascertain whether the interventions in tariff review, financial interventions and improved internal controls are achieving the desired results.

The hidden costs in the two areas of pilot intervention, Tema and Tamale therefore need to be identified at project inception in order to monitor the effect of interventions in these two pilot areas.

## ***1.2 Desired Long Term Sector Objectives***

The program logic for the proposed compact, which is derived from the problem tree, identified two key objectives under the broad umbrella of ‘**Poverty Reduction through private sector led Economic Growth**’. These key objectives are;

1. Higher individual earning potential from own employment and improved social outcomes for men and women
2. Increased productivity and profitability of small, medium and large scale businesses, employment for men and women, & private sector investment

The second objective derives from two expected outcomes, namely:

- a. Reduced outages & improved reliability of electrical supply
- b. Reduced “hidden costs”, improved fiscal position of utilities, and increased (re)investment in power sector

The second outcome above - ‘Reduced “hidden costs”, improved fiscal position of utilities, and increased (re)investment in power sector is in line with the Ministry of Energy’s “Energy Sector Strategy and Development Plan” dated February 2010, which focused on enhancing private sector investment in partnership with the public sector.’<sup>3</sup>

## ***1.3 Expected Project Outcomes***

Since hidden costs encompass the three causal problems of the weak financial state of the utilities, namely high losses (technical and commercial), non-payment of bills, and tariffs set below cost- recovery rates, the emphasis of the project in this regard will be to reduce “hidden costs” (6.3% of GDP) of the energy sector on the economy. This will involve

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<sup>3</sup> MOEn ‘Energy Sector Strategy and Development Plan’, February 2010. Section 9  
‘Financing the Energy Sector’

improvements in billing and revenue collection, the elimination of under-pricing of power, and the reduction of technical & non-technical (or commercial) losses.

Oversight of Financial systems and processes is crucial to ensuring that entities achieve the returns expected by stakeholders. In this regard, the capacity and independence of the PURC should be enhanced to allow it to wield the ‘stick’ more rather than wave the ‘carrot’ in the areas of monitoring and enforcement so as to achieve the sectors objectives of cost reflective tariffs, reduction of commercial losses and improved financial viability of the power utilities.

Whilst the problems confronting the distribution utilities are generally well understood, a clear solution to addressing the multi-faceted problems has not been available. Hence the success of the pilot programs in Tema and Tamale, would provide a clear solution to addressing these problems. A key outcome would therefore be that the lessons learned there from would be rolled out to the other special business units within the distribution companies.

#### ***1.4 Description of Project Outputs and Specific Activities***

Specific expected project outputs are as follows:

##### **POWER SECTOR WIDE INTERVENTIONS:**

1. Strengthen PURC to improve financial oversight of the sector. This includes the implementation of a sector wide Financial Accounting Framework.
2. Establish baselines for commercial losses and hidden costs within the Generation, transmission and distribution systems- VRA, ECG, NEDCO and GRIDCO
3. Establish targets and benchmarks for achievement with regulators and/ or monitoring organisation
4. Establish a system for regular and rigorous monthly monitoring of technical losses and hidden costs and taking appropriate steps to reduce same to benchmark limits and sustaining benchmark levels
5. Undertake a Revenue Improvement Program aimed at reducing the Hidden Costs of the energy sector on the economy, by addressing issues in billing & collection, technical & non-technical Losses, and underpricing within ECG, NEDCO and GRIDCO.
6. Improve financial data to facilitate tariff preparation towards a cost recovery tariff regime
7. Improve billing mechanisms to improve revenue and cash flows, including the regular billing and collections from Vendors, MDAs, MMDAs and Government agencies and the review and improvement of credit management practices within ECG and NEDCo.
8. Reinvigorate the Cross Debt mechanism for regular settlement of debts within the power sector
9. Improve the capacity of utilities to facilitate investment in the sector by private sector (established processes for PPP and IPP implemented).
10. Initiate a national gender study on lifeline tariff.



11. Organize national debate on ‘cost reflective tariff’ vis-à-vis inadequate supply of electricity.

## TEMA AND TAMALE -INTERVENTION AREAS

12. Establish baseline financial metrics and qualitative data to be monitored in the Tema and Tamale intervention areas. These include revenue collected, power transmitted to the region, aggregated technical commercial and collection (ATCC) losses, maintenance costs of equipment, direct costs of operating, debtor days, power outage frequency and duration, and customer complaints recorded and resolved,
13. Establish targets and benchmarks for achievement with regulators and/or monitoring organisation
14. Establish a system for regular and rigorous monthly monitoring of financial metrics and qualitative data and taking appropriate steps to bring same to benchmark limits and sustain benchmark levels
15. Improve revenue collection rates
16. Set up a financial reporting system to collect, collate and report financial information on revenues, expenditure, receivables and payables, and improve data capture, recording and reporting of financial and performance information, to enhance monitoring and evaluation and management performance and effectiveness.
17. Improve the information technology platform so as to harness available technology to assist staff in carrying out their duties
18. Instill core values of professionalism, integrity, innovation, commitment and excellence, and ensure the adoption of a more commercial outlook
19. Implement processes for the audit of customer metering and customer installation. This will include implementation of an auditing process which includes an independent Audit trail and feedback mechanism.
20. Profile customers within the intervention areas to facilitate the design of TOD tariffs, where possible, for demand management and introduction of more complex tariffs which are more suitable to customers.
21. Gender Audit (Organisational Gender Assessment) of ECG and Nedco)
22. Training and capacity building of ECG and Nedco staff (including gender training)
23. Promote the training of females as meter readers
24. Advocate for qualified females, not necessarily with engineering background, in management and other levels.

**1.5 Estimated cost**

<b>ITEM</b>	<b>DESCRIPTION</b>	<b>COST (US\$ million)</b>
<b>1. Improvement in Financial Performance - Sector wide</b>		
1.1	Implementation of Regulatory Financial Accounting Framework, including training and dissemination.	2.2
1.2	Power sector Financial study- Update of Ernst and young study	0.25
1.3	improving the Cross debt Mechanism	0.1
1.4	Monitoring of Hidden costs sector wide	0.25
<b>Sub-total</b>		<b>2.8</b>
<b>2. Improvement in Financial Performance - Tema and Tamale<sup>1</sup></b>		
2.1	Establishment of Base lines	0.3
2.2	Accounting Data systems for Tamale and Tema	0.85
2.3	Business process reviews in Tamale and Tema	0.5
2.4	Audit and Controls reviews in Tema and Tamale Areas	0.8
2.5	Study of effects of Prepaid metering on Revenues	0.25
2.6	Technical Assistance	2
<b>Sub-total</b>		<b>4.7</b>
<b>Total</b>		<b>7.5<sup>1</sup></b>

<sup>1</sup>Includes TA for Gender Integration activities

## 2 Project Context and Development Plans

### 2.1 Sector and Strategy Description

#### 2.1.1 Energy Sector Strategy and Development Plan (Ministry of Energy, 2010)

The MoEn's strategy to mobilize financing for the development of the power sub sector is to focus on:

- **Restoring the financial and economic soundness of utility companies.** In the past, the power sector companies have posted negative net revenues, leading to negative returns. This situation is as a result of inadequate tariffs and poor revenue collection rate. The unhealthy financial positions of the utility companies have limited their ability to adequately maintain and expand the power system infrastructure, leading to deterioration in supply quality. Resolving this concern will require efforts by Government and PURC in managing the tariff-setting process and may require the introduction of new and innovative pricing mechanisms in the tariff-setting Framework.
- **Securing private sector investments in recapitalisation of power Sector institutions.** Owing to the poor financial health of the companies and the inability of Government to inject funds into the sector, the most viable option is to secure private sector capital to finance the power sector infrastructure.
- **Increasing public financial support for investments in the power sub-sector.** The Cenit plant owned by the Social Security and National insurance Trust (SSNIT) is one of the public funded initiatives encouraged by the MoEn to increase the national generation capacity.

The document defined three key areas of focus for the medium term as follows:

#### a. Restoring the financial health of Utility Companies

- Support revision of electricity rates such that utility companies are allowed cost-recovery in the immediate term to achieve ROR of 10% by 2011;
- Enhance managerial efficiency in order to improve cooperate governance and profitability of the utilities;
- Raise revenue for critical power sector projects, with the approval of Parliament, by the imposition of levies on electricity consumption, and
- Review the rationale for setting up of various funds in order to ensure that they accrue the appropriate amount of funding, and also that they are used judiciously for the purposes for which they are established. Currently, there are a number of Funds into which levies on energy consumption are paid to finance specific development activities in the power sector. These include: (i) Rural Electrification Levy which is paid into the National Electrification Fund, (ii) Street Lighting Levy, and (iii) the Power Factor Sur-charge Levy which is paid into the Electricity Demand Management Fund.

**b. Securing increased private sector involvement**

- Support PPAs between distribution utility companies and prospective IPPS;
- Examine the possibility of private sector capital injection in Government-owned power plants, and
- Complete the necessary legal, institutional and regulatory framework that will provide comfort to the private sector. Energy Commission Act 541 provides for a number of regulations that are intended to support private sector participation in the power sector.

**c. Financing of Renewable Energy Sub-Sector**

This would involve reaching out to and encouraging the private sector to play a lead role in the development of the renewable energy sector. Currently there are no earmarked funds for the newly established renewable energy fund to support the sector, even though the statute outlines that revenues will accrue from Government, donors and the private sector. The PURC is yet to outline firm plans to include a component for renewable energy in the tariff model. Proposals for tariff reform under the proposed compact should therefore include a feed in tariff to support the renewable energy sub-sector in order to make it operational.

The Energy sector Strategy also identified three policy responses to improve the financial health of the VRA and ECG as follows:

- Ensure cost recovery tariffs for electricity production and supply
- Strengthen the PURC to determine and implement efficient cost reflective tariffs for electricity; and
- Ensure the independence of regulatory agencies

Proposed interventions to achieve the above policy responses were to :

1. Conduct an Electricity tariff study
2. Develop a financial recovery plan for the ECG and VRA

**2.2 Description of recent, ongoing expected investment in the sector**

The distribution sector made up of NED and ECG, both have a limited ability to raise long term financing for investments due to their weak balance sheets. ECG's development has been financed mainly by the World Bank and other development partners based on a mix of loans backed by GOG guarantees and grants. The ECG therefore relies on more expensive short term financing such as suppliers credit to fund its investments.

ECG's extensive program to install pre-paid metering embarked on in 2009/10 which included Build Own and Transfer (BOT) programs with vendors in key urban areas is an example of the inability of the Distributor to harness its reserves or borrow to implement the project. In spite of the exercises undertaken by the ECG

to collect, record and update data on its infrastructure over the years, the Distribution company has limited information for planning and monitoring its capital base.

NED on the other hand relies mainly on its parent company, the VRA, which also has challenges in raising capital for its own use.

The GOG's injections of capital into the sector recently in line with the GOG's policy to recapitalise the power sector utilities is generally in the form of non-cash transactions and debt to equity conversions which do not have the effect of improving infrastructure. In June 2011, for example, the Ministry of Finance converted US\$ 329.92 million of Debt owed it by the VRA into equity in the Authority . The loans converted included the HIPC relief on VRA Loans (2009-2010), Purchases of crude oil paid on behalf of VRA by the Government, sovereign bond proceeds and the EIB WAGP Loan. None of these interventions involved the injection of cash resources into VRA. GOG also received debt forgiveness and grants from the Government of Ghana during 2010.

The VRA and GRIDCO have implemented improvements in their financial reporting regimes over the period but still have to improve their financial management procedures in the areas of budgeting and cost control. The VRA has a number of ancillary services and non core activities such as their estates, schools hospitals etc which are being reviewed to make them 'cost neutral' or profit making services.

ECG and NED are yet to roll out initiatives in their costing and financial management processes even though they have been identified by management. ECG has geared its efforts more in expansion and improvements to commercial processes, and improvements to financial management have not moved in tandem with these improvements.

The PURC are in the process of preparing the Terms of Reference to engage consultants to design a sectorwide Regulatory accounting framework to improve fiscal and accounting regulation. This Framework will assist the Regulator to identify and accurately monitor key indices and indicators including energy input, energy sales and administrative control within the sector. This project is funded by the World Bank. It is proposed that the implementation of this framework be funded under Compact II.

### 3 Inventory of Existing Preparatory Work

#### 3.1 Sector Studies/ Plans

##### 3.1.1 Cost of Service Study

The PURC commissioned a study into the determination of the actual cost of servicing electricity consumers at the various voltages within the distribution system. This study is key to determining the true cost of service to the various classes of customers served by the distribution utilities.

##### 3.1.2 Electricity Transmission Ancillary Services Pricing Policy

The PURC also undertook a study to develop a policy for pricing of ancillary services (i.e. reactive power and reserve power), within the Transmission System of Ghana. A draft policy was issued for comment by stakeholders, and the policy is currently being finalised.

##### 3.1.3 National Technical and Commercial Loss Study for ECG and VRA/NED, 2012

The Ministry of Energy through the Ghana Energy Development and Access Project (GEDAP) contracted Messrs Global Energy Consulting Engineers to undertake a study on Technical and Commercial Losses occurring within the distributions systems of the ECG and VRA/NEDCo. The study was funded by the State Secretariat for Economic Affairs (SECO) of Switzerland. The assignment may be summarised as below:

- Determine level of technical and commercial losses
- Identify main causes of high losses
- Define schedule for reduction in losses

Make recommendations and propose reduction programs and measures to help achieve targets. This study is complete and the consultants have issued a draft report for comment.

##### 3.1.4 Regulatory Accounting framework

The PURC has obtained funding from the World Bank to engage a consultant to assist it prepare a Regulatory Accounting Framework to assist carry out its mission. The objective of the project is to develop a regulatory accounting framework taking into account current industry best practice and a realistic approach such that the PURC is able to effectively execute its mandate for tariff setting and review, performance monitoring and enforcement.

The information to be provided under the regulatory accounting framework and spreadsheet model should enable the PURC to perform suitable financial and economic analysis of the regulated companies in the accomplishment of its regulatory mission.

More specifically the infor will enable the PURC to:

- a) Ensure the appropriate allocation of revenue, cost and expenses between the regulated companies businesses, between business segments (customer classes) and between operating and non- operating activities.
- b) measure and analyze actual performance against target/forecast
- c) Publish information on the performance of the regulated companies to the public

The assignment is at the Request for Proposals stage.

### **3.2 Public Consultations**

Public consultations were held throughout the country on regional basis. The country was divided into three zones Southern, Middle and Northern. The Southern Zone was made up of Greater Accra, Eastern, Central and Volta Regions. Consultation meetings for the Southern Zone were held at Koforidua, regional capital of the Eastern Region. The Middle Zone was made up of Ashanti, Brong Ahafo, Western and Volta regions. Consultations meetings for the Middle Zone were held at Kumasi, regional capital of the Middle Zone. The Northern Zone was made up of Northern, Upper East and Upper West regions. Consultation meetings for the Northern Zone were held at Tamale, regional capital of the Northern Region.

Separate stakeholder consultations were held with the private sector, media, Ghana Chamber of Mines and with Parliament.

Participants included traditional leaders, non-governmental organisations, regional market organisations, physically challenged persons and representatives of political parties.

Details of consultations and responses thereto have been included in a A separate report.

### **3.3 Economic Studies**

Two studies, the Africa Infrastructure Country Diagnostic (AICD) Report- Ghana's Infrastructure: A Continental Perspective, and the Ghana Power Sector Financial Restructuring and Recovery Study by Ernst and Young, provide information on the Ghanaian electricity sector in 2009.

#### **3.3.1 AICD report highlights**

The Africa Infrastructure Country Diagnostic Report on Ghana's infrastructure 2009, and the World bank research paper by Jane O. Ebinger in 2006, highlight the fact that utilities typically compensate for hidden costs by reducing investment in maintenance; they may

also delay or forego essential maintenance and repairs or reduce the workforce, actions that trigger a downward spiral of significant deterioration in the value of assets, declining service quality, and increasing cost for each unit of service provided. When this happens, losses are increased substantially and abnormally high investment is required to carry out repairs, which is rarely cost effective<sup>4</sup>.

Since these hidden costs are generally not recorded, the utilities are not fully aware of the quantum of costs they are absorbing on behalf of the government. These hidden costs are in effect a subsidy to the consumer which cannot be sustained ad infinitum by the Utility entities. Additionally, the hidden costs do not make investment in the power sector attractive to private sector investors.

In the program logic for the proposed Compact, a key outcome, is therefore the ‘Reduction of the “hidden costs” (6.3% of GDP) in the energy sector of the economy (billings & collection, underpricing, tech & non tech Losses)’, in order to improve the financial position of GoG and the utilities, and increase public and private (re)investment in the power system.

### 3.3.2 *Ernst & Young Study (2009)*

The Ghana Power Sector Financial Restructuring and Recovery Study carried out by Ernst & Young in June 2009, was commissioned by the Ministry of Energy (MoE) and Ministry of Finance and Economic Planning (MoFEP) of the Government of Ghana (GoG). Ernst & Young were commissioned to undertake a review of the financial status of the three state-owned power utilities, VRA, GRIDCo, and ECG and propose a financial restructuring and recovery program.

The focal areas of the study were<sup>5</sup>:

- A. An assessment of the policy, legal and regulatory framework governing the power sector in Ghana, highlighting the gaps and inconsistencies which are impacting on the operation of the utilities;
- B. An operational and financial analysis of the utilities including a detailed assessment of the current debt position of the utilities and financial projection for the next ten years; and
- C. Recommendations for financial restructuring and recovery, including a program (action plan) with the timings and responsibilities for the stakeholders to implement those recommendations.

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<sup>4</sup> Measuring Financial Performance in Infrastructure: An Application to Europe and Central Asia Jane O. Ebinger

<sup>5</sup> Ghana Power Sector Financial Restructuring and Recovery Study 2009



According to the Ernst & Young report, the Utilities had been in a position of financial distress for some years, largely due to an increase in the cost of producing electricity without a commensurate increase in the regulated price of electricity. This inability to cover total costs, and in some years even operating costs, had most severely impacted VRA. ECG and GRIDCo had been less affected because the generators had been unable to pass on their increased costs. However, due to allowed losses being less than actual losses, both ECG and GRIDCo nevertheless faced decreasing profitability.

The report indicated that the absence of a clear framework for tariff-setting, as well as uncertainty in projecting commodity prices and economic parameters, had resulted in long term financial forecasts being subject to uncertainty. It further projected that assuming the end user regulated price of electricity remained at the 2008 levels, there would be a shortfall of GH¢30.3bn over the next ten years (for the period 2008 to 2018). It also noted that large debt and other obligations had been managed well in spite of the uneconomic position of the companies, but indicated that without increases in the revenue for the utilities (VRA in particular), restructuring of the existing debts would not result in appreciable benefit or savings.

Ernst and Young proposed the following recommendations to address the issues identified above:

- Increased revenue or recapitalisation (through equity or refinancing) must be implemented together. i.e.; if more capital is injected into the sector, tariffs may not need to increase so much, while if tariffs are increased significantly, the capital injection required may be lower.
- Action without addressing the governance and regulatory framework inadequacies will not result in the full realisation of the potential benefits of these measures.
- A direct GoG equity injection of GH¢1.25bn together with a 51% increase in end user tariffs in 2010 assuming the objective of placing the utilities on a standalone commercial basis in the shortest timeframe possible

### *3.3.3 Developments since 2009*

The financial results of VRA, ECG, GRIDCO and NEDCo (Appendices: preliminary studies) show that the VRA and GRIDCO have both posted operating and net profits for the years ended 31 December 2009 and 2011. After posting a profit in 2010, ECG has moved back to the loss making position of the pre-2009 period and NEDCo remains a loss making entity.

A more in-depth study of the overall results of the entities will be required to fully interrogate the causal factors, however at this preliminary stage it is evident that the interventions of the compact from a financial point of view will have a greater impact if they are mainly focussed on the distribution sector of the Ghanaian power sector, i.e. the ECG and NEDCo.

Improvements in the ability of the ECG and NEDCo's to collect their revenues and pay their bills to VRA, GRIDCo and the IPPs is crucial to improving the financial position of **all** entities within the Ghanaian power sector.

The above conclusions are based on a review of the financials of the VRA, GRDICO, ECG, and NEDCo as shown in the appendices. The key findings supporting these conclusions are highlighted below:

**a) Post-2009 Increase in the PURC Tariff**

The Ernst and Young report recommended an increase in tariff of at least 51% to improve the financial performance of the utilities. In 2010, the PURC announced an unprecedented 89% increase in tariff, the impact of which was not fully reflected in the financials of the Utilities for the year ended 31 December 2010. VRA, and ECG posted increases greater than 100% in their operating profits from 2009 to 2010 and also in 2011 over 2010. GRIDCO also improved its operating profits from a loss of GHC 3.787m in 2009 to an operating profit of 61.5m in 2010 and recorded a 40% increase in operating profits in 2011 over 2010.

These improvements in operating profit can be mainly attributed to the increase in the PURC tariff, even though VRA also increased its tariffs to the Mines during 2011.

It is in this regard that improvements to the tariff setting process have been identified as a key intervention to improve the financial health of the entities in the power sector under the proposed compact

**b) Installation of pre-paid meters in ECG**

The introduction of Pre-paid metering systems is another development which occurred after the Ernst and Young report. It is critically important that the impact of this change in policy is identified and analysed before determining further solutions to improving the credit management and revenue collection processes of the ECG. It is important to note that the financial results of the company do not reflect an increase in profitability as a result of the prepaid metering initiative. The profits of the company rose marginally in 2010 and returned to the loss position in 2011 as per the provisional results for the year. The increased profitability in 2010 cannot be only attributed to the prepaid metering project since the Government of Ghana injected capital into ECG during 2010 and not in 2011. Collection rates in 2010 and 2011 were not significantly higher those in prior periods.

An in-depth review of the pre-paid metering program will be required prior to full national roll out. In this regard, the proposed pilot programs in the Tema and Tamale regions will be used to study the prepaid program under the compact

**c) Government debt forgiveness**

In line with the GOG's policy to recapitalise the power sector utilities, in June 2011, the Ministry of Finance converted US\$ 329.92 million of Debt owed it by the VRA into equity in the Authority . The loans converted included the HIPC relief on VRA Loans (2009-2010), Purchases of crude oil paid on behalf of VRA by the Government, sovereign bond proceeds and the EIB WAGP Loan. None of these interventions involved the injection of cash resources into VRA.

Both the VRA and ECG received debt forgiveness and grants from the Government of Ghana during 2010. Both organisations posted profits during the year, but the ECG reverted to a loss position in 2011 while the VRA posted a 160 % increase in operating and net profits over 2010 in 2011. Government intervention thus had a greater impact on the VRA results than on those of ECG.

**d) Split of GRIDCO and NED from VRA**

It will be recalled that the separation of GRIDCO and NEDCo from the VRA occurred after the period reviewed by the Ernst and Young Report. The separation of these companies has an impact on the resultant financials because of the changes in synergies and cost sharing/ allocation mechanisms which the VRA used when the companies were part of the combined VRA.

The separation of NED from VRA has significantly improved its profitability since the loss making subsidiary's results hitherto reduced the VRA's profitability. The separation of GRIDCO from the VRA did not have a significant impact on VRA's profitability since transmission was not a loss making operation. However GRIDCO's financial position since the separation from VRA improved significantly in 2010 and 2011 since the organisation did not 'inherit' any ancillary activities from the VRA in the transfer and its costs and revenues appear to be appropriately matched. GRIDCO's current financial issues are cash flow related due to the late payment culture of the ECG. Thus GRIDCO's recurrent financial issues can be resolved if the ECG is restructured to pay its bills to them on a month on month basis.

**e) Impact of operating IPPs on the results of Distribution companies**

Improvements to ECG's financial position are critical to attracting IPPs into the power sector. Currently new entrants into the sector generally seek to obtain sovereign and other guarantees to ensure that they will receive their revenue on time. ECG is also reluctant to sign PPAs with plants operating on LCO since the current tariff would not cover the cost of an increased proportion of LCO based thermal generation. It should be noted that ECG has signed PPAs with Bui Power (hydro plant) and Sunon Asogli (gas fired thermal plant), however CENIT Power whose power plant is almost complete (and will be fired on LCO until additional gas is made available) is yet to secure a PPA with the Distributor.

f) **Effect of the implementation of International Financial Reporting Standards (IFRS) on reported results**

The International Financial Reporting Standards (IFRS) are issued by the International Accounting Standards Board (IASB), an independent, international organization supported by the professional accountancy bodies worldwide. The objective of these standards is to achieve uniformity and transparency in the accounting principles that are used by businesses and other organizations for financial reporting worldwide.

Ghana's adoption of the International Financial Reporting Standards (IFRS) in January 2007 required the preparation, submission and publication of IFRS-compliant financial reports for Multi-nationals, Banks and all 'Public Interest Companies' by 2009. The VRA, ECG, GRIDCO and NEDCO converted to the IFRS in 2010 and restated their results in 2009 for effective comparison.

The impact of the transition to the more transparent and internationally comparable accounting standards required the entities to review their accounting policies to align to the international standards. The full effect of the changes in the reporting regime on the reported financial results of the entities in the sector needs further analysis.

g) **Impact of internal changes and improvements on the financial performance of utilities**

The utilities have also instituted internal reforms and improvements in their internal process to improve financial performance and data capture.

A case in point is the VRA which identified the need to restructure the Chart of Accounts (COA) as a crucial step for the preparation of Separated Accounts and internationally recognised financial reports. The chart of accounts (COA) is the backbone to any Financial Management and Accounting system and is essential for the classification of the financial data the system holds. Major classifications of accounting data are income, expenditure, assets, liabilities, reserves and equity. Within each major classification, further classification occurs in order to provide detailed financial information. The restructured chart of accounts will allow the Authority to prepare reports on the financial performance and position each of its business units in a timely manner.

The revised chart of accounts will be migrated onto the Oracle ERP platform under implementation which will also facilitate forecasting and data analysis.

The VRA and GRIDCO have implemented improvements in their financial reporting regimes over the period but still have to improve their financial management procedures in the areas budgeting and cost control. The VRA has a

number of ancillary services and non core activities such as their estates, schools hospitals etc which are being reviewed to make them ‘cost neutral’ or profit making services.

ECCG and NED are yet to roll out initiatives in their costing and financial management processes even though they have been identified by management. ECCG has geared its efforts more in expansion and improvements to commercial processes and financial management have not moved in tandem with these improvements.

The pilots in Tema and Tamale will need to have cost identification, recording, reporting and control as key financial management interventions in built into the program. These interventions may not require significant additional costs since they depend mainly on the will and management styles of the governing bodies.

#### **3.4 *Social and Gender Studies***

#### **3.5 *Supporting Technical Data***

Partial list provided, to be finalised

#### **3.6 *Preliminary Studies***

To be initiated

#### **3.7 *Full Feasibility Studies***

To be initiated

#### **3.8 *Detailed Budgets***

#### **3.9 *Environmental and Social Impact Analysis***

Environmental impact N/A

#### **3.10 *Gender Analysis***

It is important to note the constraints and challenges in ensuring social and gender integration in the energy sector and also the good practices in the productive use of electricity and how these impact on the socio-economic lives of the poor particularly poor rural women. Energy is a prime ingredient in all productive, subsistence and leisure activities. The quantity and quality of available energy determines the efficiency and effectiveness of activities, as well as the quality of life of the users. Both male and female members of society are equal stakeholders in benefiting from energy use. But women and men do not benefit equally from access to energy. The same energy service may indeed impact on men and women differently, with different social or economic outcomes. Whilst national development plans often give some focus and attention to energy, little attention is paid to the linkage between gender and energy particularly in the area of implementation. Ghana is no different from other countries in this respect.

Ghana has an energy policy and one of the goals outlined in the policy is to integrate gender in the Energy Sector. The Gender Assessment of the Energy Sector Report (2010) highlights major challenges of the gender integration process as follows:

- Lack of energy sector sex disaggregated data which makes it difficult to estimate the number of women and men who have access to energy services
- Inadequate stakeholder consultation in program and policy development.
- Lack of personnel and gender experts within the energy sector due to lack of training in gender and non-commitment of financial resources.
- No budget for gender integration activities.
- Limited involvement of women in the planning and management of energy services at national, regional and district levels.
- Limited capacity of women in management positions in the Energy Sector

### ***3.11 Resettlement Action Plans***

N/A

## **4 Project Benefits and Beneficiaries**

The proposed projects are expected to contribute to economic growth, poverty reduction, stimulation of private sector growth as well as meeting the targets of the Ghana Shared Growth and Development Agenda (GSGDA). Since poverty is one of the key drivers of environmental degradation in the country, the project will contribute positively to sustainable development efforts in Ghana and implementation of the GSGDA.

The direct beneficiary institutions of the project are the PURC, the ECG, and NED

### ***4.1 General Assumptions***

The calculation of the ERR for this project, required some assumptions, namely:

1. The target population was the entire nation;
2. We also use the figure for annual GDP of Ghana (USD) from Ghana Statistical Service which is \$39,150,530,000 USD;
3. Total value of commercial and collection losses for ECG is given as \$355,444,275.91 USD;
4. Total value of NEDCo commercial and collection losses is also given as \$11,326,057.57 USD;
5. the calculation of ERR supposes a period of 20 years, beginning in 2012 until 2032.

### ***4.2 General inputs***

The calculation the ERR for the project, required some inputs, namely: (1) the population growth of 2.5% for the 2010 Census data by Ghana Statistical Service; (2) it was assumed that the Tema losses as a percent of total ECG losses is 18%; (3) 1% reduction each in ECG

and NEDCo losses per year for 5 years due to intervention; (4) the total cost of investment, in nominal terms, from MCC is \$7.5 USD Million; (5) Hidden cost reduction per year is assumed at 1% (6) the exchange rate used is \$1.00 USD = ₵1.5 Ghana cedis.

### 4.3 General Outputs

- The ERR for the Sector Wide governance project is 53%;
- The NPV of the benefit stream is \$15,256,517.20 USD;
- The NPV of the cost is \$4,352,608.51 USD.

### 4.4 General Outcome

- Based on our assumption, the distribution of income (consumption) for the year 2032 is: 17.70% for those living on less than \$ 1.25 USD per day; 38.9% for those less than \$2.00 USD per day; 36.5% between \$ 2.00 – \$ 4.00 USD per day, and finally 24.6% for people with more than \$ 4.00 USD per day;
- In terms of the cost effectiveness we find that the present value of the benefits stream to the cost of the investment is about 2.03 for all beneficiaries. For those living with less than \$ 2.00 USD per day it is 0.62, for those between \$ 2.00 – \$ 4.00 it is 1.03, and for those living on more than \$ 4.00 USD per day it is 1.72.

**Table 1 - Beneficiary Analysis**

<b>MCC Cost (Millions USD)</b>	<b>\$7.500</b>				
<b>20-Year ERR</b>	<b>52.5%</b>				
<b>Present Value (PV) of All Costs (Millions PPP \$)</b>	<b>\$4.4</b>				
<b>PV of Benefit Stream (Millions PPP \$)</b>	<b>\$15.3</b>				
<b>Beneficiaries</b>	<b>Total</b>	<b>Consumption per day (2005 PPP \$)</b>			
		<b>&lt; \$1.25</b>	<b>&lt; \$2<sup>1</sup></b>	<b>\$2-\$4</b>	<b>&gt; \$4</b>
Beneficiary Households in Year 20 (#)	9,420,254				
Beneficiary Individuals in Year 20 (#)	42,451,924				
National Population in Year 20 <sup>2</sup> (#)	42,451,924				
Beneficiary Population by Poverty Level <sup>3</sup> (%)		17.70%	38.90%	36.50%	24.60%
National Population by Poverty Level <sup>3</sup> (%)		17.70%	38.90%	36.50%	24.60%
<b>The Magnitude of the Benefits</b>					
PV of Benefit Stream Per Beneficiary (USD)	\$0.59	\$0.22	\$0.28	\$0.50	\$1.24
PV of Benefit Stream as Share of Annual Income (%)	0.13%	0.11%	0.11%	0.12%	0.18%
<b>Cost Effectiveness</b>					
PV of Benefit Stream/Project Dollar (USD)	2.03	0.222	0.621	1.025	1.722

<b>Percent of Project Participants Who Are Female</b>	51%
GNI per capita <sup>4</sup> (USD)	\$1,571
Current National Population	24,658,823

NB: all benefits incremental; PVs based on 22% discount rate and exclude MCC costs but net out any local costs

<sup>1</sup> The beneficiaries and population living on less than \$2 per day include those under \$1.25 per day

<sup>2</sup> Based on current population estimate, projected to Year 20

<sup>3</sup> Based on GLSS5 estimates, extrapolated to 2011.

<sup>4</sup> See GSS Time series National Income, 2012

## **5 Environmental, Social and Gender Risks and Opportunities**

### **5.1 Environmental**

N/A

## **6 Project Sustainability**

### **6.1 Environmental Sustainability**

N/A.

### **6.2 Operations and Maintenance – Finance**

Operation and maintenance of the expenses associated with activities within this section will be covered from a portion of incremental revenue obtained for the ECG, NED and PURC as a result of activities resulting from the loss reduction program, improved procedures for tariff revision and improved financial management practices within the power sector.

The institution of a tariff which is cost-reflective, includes risk and scope for investment, will allow Generators, the Transmission company and Distribution Companies within the sector cover their operating and maintenance costs. The improved reporting framework will also allow the Public Utilities Regulatory Commission (PURC), the regulatory body obtain objective and regular information from utilities for improved regulatory supervision and enforcement to better meet stakeholder expectations.

### **6.3 Operations and Maintenance – Institutional**

See Power distribution and utilization Concept paper

### **6.4 Tariffs and User Fees**

See Distribution Concept Paper



## 6.5 Policy, Legal and Regulatory Issues

### REGULATORY ISSUES

#### PURC

The realisation of the MOEn's objective to restore the financial health of the utilities within the energy sector by allowing cost recovery in tariffs in the medium term, enhancing efficiency and improving corporate governance and profitability and raising revenue for infrastructural expansion, depends largely the ability of the two regulators of the sector to act increasingly independently of the ultimate shareholder (the Government of Ghana's) in their enforcement roles.

This particular concept paper highlights the need for the strengthening of the regulators in their oversight and enforcement roles in the distribution section of the industry because this is crucial to the realisation of the objectives of the intervention. Unlike in the generation section of the industry where competition through the increased participation by IPP's could in itself drive improvements within the public sector generators, in the distribution sector, improved oversight and benchmarking which results in enforcement is the main method for improved accountability, transparency and sustainable financial performance.

Additionally improved external scrutiny by independent parties such as the regulators and external auditors are expected to drive improvements and tackle internal governance challenges within NED and ECG.

In this regard the emphasis of on the strengthening of the capacity of the PURC to exert the required influence to improve accountability, transparency, improved commercial focus and thereby enhance the financial management processes of the utilities will go a long way to depoliticise the sector and instill sustained financial viability of the entities. A case in point is the cross debt arrangement which is technically a tri-partite reconciliation or clearing house for receivables and payables within the sector. The government of Ghana, the public sector utilities (VRA/NED, ECG and Gridco) with representation of the Ministry of Finance are the entities involved in this arrangement. Agreed Paybles and recievables from this exercise are settled by the Ministry of Finance. The arrangement has been in operation for over ten years, but the regularity of this settlement process has been the main point of concern because delays in settlement have seious impact on cash and working capital of the utilities. A strengthened PURC could monitor the regularity of the process or even take over the arrangement since the results of the exercise are useful to the PURC for pricing and monitoring purposes.

The capacity and independence of the PURC's should be enhanced to allow it to wield the 'stick' more rather than wave the 'carrot' in the areas of monitoring and enforcement. The PURC's should seek to set verifiable targets and easily measurable benchmarks in areas that enhance financial viability and operating efficiency of the utilities. In addition, publicly reporting on process performance indicators and being more proactive in finding solutions and initiatives to assist the utilities and the GOG to operate more effectively in the power sector should be possible once the Regulator is provided with the necessary tools and skills.

The implementation of the Regulated Accounting Framework which the PURC is planning to undertake is key in providing a robust monitoring framework and ensuring that accurate data is provided for tariff setting and review. The financial, operating and accounting output data from the framework will be available for use by the Compact 2 Monitoring and Evaluation team.

Tema and Tamale pilot areas

The current structure of financial reporting within ECG and VRA /NED do not allow for the accounting data of the Tema and Tamale pilot areas to be easily accessible for monitoring purposes.

It is therefore necessary to agree with the NEDCo and ECG to initiate processes to identify the costs and revenues of these areas during the compact period to ascertain the profitability or otherwise of the pilot areas and facilitate monitoring and evaluation of the intervention.

The options available are either:

- To require a separation of the books of ECG and NEDCo in this regard or
- to establish a parallel system within these areas to collect data on revenues, direct and indirect costs (including payroll, finance and capital costs) during the compact period.

A business process review of procedures within the pilot areas will also be necessary to ensure that the procedures and processes are sufficiently robust to support the improvements expected during the compact period.

The other legal, structural and regulatory issues have been highlighted in the Concept papers on Distribution and Increasing Private Sector Investment Through Power Sector Reform.

## **7 Project Results and M&E Methodology/Plan**

See M&E strategy document

### **7.1 Summary of Program Logic**

See program logic in M&E strategy document

### **7.2 Potential Indicators**

## **SECTOR WIDE**

**The following indicators could be used to monitor the Improved Financial Sustainability / Solvency of utilities over the compact period. This will be a sector wide ratio analysis**

Cost Recovery Ratio-

- Total Actual Revenue / Projected operating expenses
- Total Actual Revenue / Projected operating expenses plus capital replacement costs
- Total Actual Revenue / Projected operating expenses plus capital replacement plus capital expansion costs

Debt Equity Ratio - Total Debt / Total Equity

Acid or Quick Test

Current Ratio

- Current Assets / Current Liabilities, excluding receivables and stocks
- Current Assets / Current Liabilities

Billing and Collection Efficiency

- [total revenue from post-paid bills collected in current month / total post-paid billed in previous month] x 100

Electricity Metered

Average Collection Period in days

Bad Debt

Average Creditor Days

Publication of Audited Financial Statements - timing

Financial Plans updated

capital gap financed by GOG

## TEMA AND TAMALE PILOT AREAS – RATIO ANALYSIS AND INDICATORS

Cost Recovery Ratio-

- Total Actual Revenue / Projected operating expenses
- Total Actual Revenue / Projected operating expenses plus capital replacement costs
- Total Actual Revenue / Projected operating expenses plus capital replacement plus capital expansion costs

Debt Equity Ratio - Total Debt / Total Equity

Acid or Quick Test

Current Ratio

- Current Assets / Current Liabilities, excluding receivables and stocks
- Current Assets / Current Liabilities

#### Billing and Collection Efficiency[

- total revenue from post-paid bills collected in current month / total post-paid billed in previous month] x 100

#### Electricity Metered

#### Average Collection Period in days

#### Bad Debt

### 7.3 *Data Gaps*

Segregated financial data for the preparation of Profit and Loss Accounts for the Tema and Tamale pilot areas for benchmarking or at project inception

### 7.4 *Impact Evaluation Opportunities*

To be finalised

### 7.5 *M&E Sources and Reference Documents*

See M and E Plan

## 8 **Implementation Arrangements**

To be agreed

### 8.1 *Description of Government or Other Entities that would have a Role in Oversight and Implementation of the Concept Project*

- **The Public Utilities Regulatory Commission (PURC)** is Ghana's independent Economic and quality of service regulatory body with oversight responsibility for the electricity, gas and water sectors and as such is responsible for setting and reviewing tariffs for these services.
- **The Electricity Company of Ghana Limited (ECG)** is a state owned utility responsible for the distribution and retail supply of electricity to customers in six regions out of the ten regions in Ghana, namely Greater Accra, Volta, Eastern, Ashanti, Western and Central regions. ECG is constituted as 9 Electrical regions
- **The Northern Electricity Department (NED)** is a subsidiary of the Volta River Authority (VRA) which is also a state owned utility responsible for distribution and retail supply of electricity to customers in the four remaining regions in Ghana, namely Brong Ahafo, Northern, Upper West and Upper East regions.
- The Ministry of Energy (MOEn)
- Ministry of Finance and Economic Planning (MOFEP)

The Energy Commission (EC) is responsible for technical regulation of the power sub-sector, including licensing of operators. In addition, EC also advises the Ministry of Energy on matters relating to energy planning and policy.

**8.2 *Implementation of Timeline***

To be agreed

**8.3 *Consultations and Accountability***

To be identified

**8.4 *Plans for Longer Term Project Activities***

Yet to be determined

## 9 APPENDICES

### 9.1 Preliminary Studies OVERVIEW OF THE UTILITIES – CURRENT SITUATION

#### A. GENERATION ENTITIES

#### 1. Volta River Authority (VRA)

#### Volta River Authority

#### FINANCIAL REVIEW

	Ernst and Young Study period			Current Period		
	2006	2007	2008	2009	2010	2011
	GH¢'000	GH¢'000	GH¢'000	GH¢'000	GH¢'000	GH¢'001
Income from Sale of Electricity	429,272	382,803	616,591	754,821	1,077,642	1,110,794
Other operating income	11,320	10,848	60,031	17,559	29,208	36,048
Government Assistance	41,457	307,383	264,032	-	477,120	-
Operating and General Expenses	531,462	626,548	763,311	761,090	1,053,421	1,008,183
Depreciation	67,677	66,044	60,937	81,606	78,151	111,205
Operating (Loss)/Profit	(160,433)	(304,699)	(86,689)	11,290	53,429	138,659
Interest & Commitment Charges	16,341	23,519	23,292	50,091	36,567	37,745
Financial Income	387	1,347	3,939	3,507	4,906	4,906
Exchange Fluctuation Debt	(16,145)	(20,943)	(34,003)	(38,699)	(8,343)	(14,677)
Net (Loss)/ Profit for the year	(151,462)	(41,778)	(122,535)	76,958	29,880	80,201
Fixed Asset (Cost/ Valuation)	3,044,227	3,275,551	3,312,448	3,999,163	4,171,985	5,223,330
Fixed Asset (Net Book Value)	1,689,541	1,695,733	1,694,438	1,964,759	1,968,398	2,616,063
Capital Work in Progress	35,755	121,019	164,140	208,610	278,501	253,384
Current Assets	310,829	328,606	623,626	729,442	867,412	1,077,285
Current Liabilities	212,950	290,323	402,482	490,120	373,319	434,735
Investment by the Rep. of Ghana	37	18,329	18,329	18,329	495,449	495,449
Capital Surplus	1,594,699	1,646,402	1,715,362	2,052,106	2,059,524	2,617,578
Income Surplus Account	(101,411)	(94,996)	78,614	43,191	141,723	294,592
Long Term Loans	298,973	219,188	197,492	218,624	241,588	259,782
GH¢ to US\$ Exchange Rate	0.9210	0.9599	1.2138	1.4340	1.4532	1.5841

**Volta River Authority**

**FINANCIAL REVIEW**

		<b>Ernst and Young Study period</b>			<b>Current Period</b>		
		<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>
		GH¢'000	GH¢'000	GH¢'000	GH¢'000	GH¢'000	GH¢'001
<b>Yearly Summary of Financial Ratios</b>							
Return on Average Equity	%	(11.55)	(19.68)	(4.64)	0.33	2.10	4.39
Return on Average Net Fixed Asset - Plant in operation	%	(10.19)	(17.20)	(4.57)	(0.41)	2.40	5.39
Current Asset Ratio	Times	1.46	1.13	1.55	1.45	2.69	2.52
Debt Service Ratio	Times	(1.66)	(1.69)	(0.10)	0.30	0.84	1.85
Gearing Ratio	%	0.22	0.22	0.11	0.09	0.08	0.07
GWh Generated and Purchased less Station Use (X10 <sup>6</sup> )	GWh	9,007	7,092	8,144	9,127	10,227	10,055
Total production Expenses including depreciation per MWh	Ghana Cedis	66.52	97.66	93.65	83.39	103.01	100.27
Total cost of production Expenses depreciation and interest but excluding Debt Fluctuation per MWh	Ghana Cedis	68.33	100.97	96.51	88.88	106.58	104.02
Average Revenue/MWh Generated and Purchased	Ghana Cedis	48.96	55.70	83.52	85.01	108.71	114.29

B. TRANSMISSION COMPANY

1. Ghana Grid Company Ltd (GRIDCO)

Financial Summary  
Ghana Grid Company Ltd  
(GRIDCO)

	Ernst and Young Study period	Current Period		
	2008 GH¢'000	2009 GH¢'000	2010 GH¢'000	2011 GH¢'000
Transmission income	72,877	78,696	164,950	235,563
Wheeling income	1,827	2,068	-	57
Other operating income	289	1,422	1,602	1,562
Government Assistance	1,713	-	-	-
Direct Cost	29,084	59,830	88,501	114,615
Administrative Expenses	45,581	26,146	16,553	36,281
Depreciation	15,719	21,454	23,706	29,861
Operating (Loss)/Profit	2,040	(3,787)	61,498	86,286
Finance cost	(1,644)	(3,915)	(3,046)	(3,231)
Financial Income	39	844	587	796
Exchange Loss	(8,440)			
Net (Loss)/ Profit for the year	436	(6,858)	59,039	83,851
Taxation	-	-	-	-



Fixed Asset (Cost/ Valuation)	851,894	488,386	486,655	614,388
Fixed Asset (Net Book Value)	400,621	414,152	407,034	237,222
Capital Work in Progress	33,756	59,803	62,354	149,595
Investments	871	781	2,347	6,571
Current Assets	40,216	16,566	116,701	237,222
Current Liabilities	24,942	10,271	45,923	90,741
Investment by the Rep. of Ghana	1	1	1	1
Amt held towards capital	249,114	252,036	252,036	252,036
Capital Surplus	79,942	150,942	152,897	144,438
Income Surplus Account	4,803	(10,972)	59,302	211,162
Long Term Loans	82,905	103,541	95,697	159,913
GH¢ to US\$ Exchange Rate	1.2138	1.4300	1.4300	1.5841

### Yearly Summary of Financial Ratios

		2008	2009	2010	
Return on Average Equity	%	0.01	(0.02)	0.20	0.17
Return on Average Net Fixed					
Asset - Plant in operation	%	0.00	(0.02)	0.18	0.92
Current Asset Ratio	Times	1.61	1.61	2.54	2.61
Debt Service Ratio	%	43%	45%	56%	99%

C. DISTRIBUTION COMPANIES

**Electricity Company of Ghana**

Financial Summary

	Ernst and Young Study period			Current Period		
	2006 GH¢'000	2007 GH¢'000	2008 GH¢'000	2009 GH¢'000	2010 GH¢'000	2011 Provisional GH¢'000
Income from Sale of Electricity	2,875	348,689	598,445	616,079	923,617	1,216,406
Other operating income	441	40,179	21,845	74,790	52,839	1,489
Government Assistance	41,457	307,383	264,032	-	477,120	-
Operating and General Expenses	384	59,001	65,689	101,042	111,914	124,536
Depreciation	580	58,876	77,161	82,082	70,214	175,246
Operating (Loss)/Profit	(475)	(48,837)	11,598	32,058	38,565	(46,162)
Interest & Commitment Charges	(494)	4,825	(5,090)	(4,822)	(4,649)	(5,123)
Financial Income	387	1,247	3,939	11,118	17,051	3,059
Exchange Fluctuation Debt	(65)	(3,556)	(19,748)	(15,905)	(46)	(897)
Net (Loss)/ Profit for the year	(34)	(8,658)	(25,082)	(43,350)	1,149	(61,352)
Fixed Asset (Cost/ Valuation)	7,702	807,944	1,036,283	2,657,952	2,791,158	1,611,078
Fixed Asset (Net Book Value)	-	804,944	1,036,283	1,174,081	1,180,080	2,519,694
Capital Work in Progress	884	126,042	134,914	253,101	422,811	628,318
Current Assets	3,451	440,826	672,775	628,192	946,528	1,068,274
Current Liabilities	1,730	208,106	251,206	388,513	631,597	790,110
Investment by the Rep. of Ghana	50,000	5,000	5,000	5,000	5,000	5,000
Capital Surplus	6,918	723,236	932,330	1,082,018	1,077,515	2,009,944
Income Surplus Account	759	97,336	161,265	42,461	84,914	113,777
Long Term Loans	639	52,389	71,689	165,509	96,624	175,544
GH¢ to US\$ Exchange Rate	0.9210	0.9599	1.2138	1.4340	1.4532	1.5841

**Yearly Summary of Financial Ratios**

## Electricity Company of Ghana

### Financial Summary

		Ernst and Young Study period			Current Period		
		2006	2007	2008	2009	2010	2011
		GH¢'000	GH¢'000	GH¢'000	GH¢'000	GH¢'000	Provisional GH¢'000
Return on Average Equity	%	(0.06)	(0.06)	0.01	0.02	0.03	(0.02)
Return on Average Net Fixed							
Asset - Plant in operation	%		(0.02)	(0.04)	(0.05)	0.00	(0.03)
Current Asset Ratio	Times	2.00	2.12	2.68	1.62	1.50	1.35
Debt Service Ratio	Times	0.05	52.10	64.58	110.80	145.64	193.13
Gearing Ratio	%	0.05	52.10	64.58	110.80	145.64	193.13

### 2. Northern Electrification Development Company (NEDCo)

## Northern Electrification Company-Volta River Authority

### FINANCIAL REVIEW

		Ernst and Young Study period			Current Period		
		2006	2007	2008	2009	2010	2011
		GH¢'000	GH¢'000	GH¢'000	GH¢'000	GH¢'000	GH¢'001
Income from Sale of Electricity						94,366	123,978
Other operating income						603	836
Government Assistance							-
Operating and General Expenses						135,163	170,682
Depreciation						23,992	39,370
Operating (Loss)						(40,194)	(45,868)
Interest & Commitment Charges							-
Exchange Fluctuation Debt							
Net (Loss)/ Profit for the year						(39,431)	(45,416)
Fixed Asset (Cost/ Valuation)							
Fixed Asset (Net Book Value)						281,917	452,632
Capital Work in Progress							
Current Assets						97,303	133,203
Current Liabilities						142,115	181,260
Shareholders' investment						55,060	57,004

Capital Surplus		304,426	492,933
Income Surplus Account		(122,381)	(145,362)
Long Term Loans			
GH¢ to US\$ Exchange Rate		1.4532	1.5841
<b>Five Year Summary of Financial Ratios</b>			
Return on Average Equity	%	(0.17)	(0.11)
Return on Average Net Fixed Asset - Plant in operation	%	(0.12)	(0.09)
Current Asset Ratio	Times	0.68	0.73
Debt Service Ratio	Times	2.58	3.18
Gearing Ratio	%	258 %	318%