

PUBLIC UTILITIES REGULATORY COMMISSION

TEMPLATE FOR FILING

OF

TARIFF PROPOSALS

BY

GENERATION COMPANIES

JANAURY 2013

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1 Introduction

1.1 Background

Due to the inadequate tariff, VRA is unable to meet fully its operational expenditures such as crude oil purchases for the running of the Takoradi Thermal Plants. Government has provided financial support to VRA in order to meet its operational expenditure. The financial support has been an indirect way of Government making up for the shortfall between the economic tariff and the PURC approved rates. The Government support comes in as and when VRA experiences challenges in procuring crude oil or paying for power imports from CIE.

1.2 Rationale/Objectives Underpinning Tariff Submission

The Volta River Authority (VRA) hereby requests an upward adjustment in the Bulk Generation Tariff (BST) to reflect increases in costs of power supply.

1.3 Legislative Provision(s) in support of Tariff Application

The Tariff application is in accordance with the Public Utilities Regulatory Commission (PURC) Act, 1997, Act 538 (Sections 16, 17 and 20).

1.4 Highlights of major issues which describe Structure of Tariff Submission

The major issues which describe the structure of the Tariff submission are as follows:

- Increased Exchange Rate; the exchange rate increased from 1.525 GH¢/\$ in 2011 to 2.092 GH¢/\$ in 2013.
- Increased Crude Oil Price; crude oil also increased from 119.08 US/bbl in 2011 to 119.79 US/bbl in 2013
- Increased thermal percentage in generation mix; thermal percentage increased from 25% in 2011 to 40% in 2013.
- Increased LCO and Gas requirements

2 Initiatives Undertaken since June 2010 Tariff Review

2.1 Projects Undertaken

- Commissioning of T3 Plant
- Refurbishment of Akosombo Generation System
- Restoration of steam turbine
- Commencement of the Kpone Project
- Completion of 2MW Solar Project in Navrongo

2.2 Compliance with Directives of the Commission

- Efficiency Improvement – Steam Turbine back in Service
- Improvement in availability of Plants
- Gas conversion of Diesel Plants

3 Key Policy Issues for Tariff Consideration

- Provide Initial Support for Operationalisation of NEDCo (OPEX and CAPEX)
- Establishment of SBUs support

4 Proposed Service Delivery and Efficiency Improvements during Tariff Period

4.1 Service Delivery & Efficiency Targets

The following were the Utilisation factors for 2011 and 2012.

Utilisation Factor (%)	2011	2012	Remarks
Akosombo GS	77.07	78.98	
Kpong GS	86.53	88.57	
Takoradi Thermal Power Plant	68.49	61.02	
Tema Thermal Power - Station 1 (MRP)	2.51	5.05	
Tema Thermal Power - Station 2 (TT1PP)	56.69	64.53	
Tema Thermal Power - Station 3 (TT2PP)	10.24	39.26	

4.2 Technical / Operating Performance Indicators/Indices

Generation Availability Factor (%)	2011	2012	2013 Target
Akosombo GS	97.24	98.96	94
Kpong GS	91.60	94.44	94
Takoradi Thermal Power Plant	91.40	75.65	70
Tema Thermal Power - Station 1 (MRP)	40.55	39.25	75
Tema Thermal Power - Station 2 (TT1PP)	80.11	94.03	85
Tema Thermal Power - Station 3 (TT2PP)	79.20	75.55	85

4.3 Financial Performance Indicators/Indices

At the existing tariff VRA will experience a net operating loss of GH¢1,003.24 million. VRA will therefore be unable to generate adequate funds to meet its cost of electricity generation and supply for 2013. The 2013 Tariff Adjustment Proposal seeks a 128.29% increase in the BGT from GH¢ 0.084495/kWh to GH¢0.1929/kWh, effective 1st April 2013. Based on the computed cost of supply of GH¢0.1929/kWh in 2013, VRA will experience a net operating income of GH¢21.97 million if the tariff had taken effect from 1st January 2013. On the other hand, if the tariff is effective 1st April 2013, the above operating income will not be realized without government support.

5 Key Challenges Likely to Impact Service Delivery

5.1 Fuel Availability

In the light of the erratic supply of Natural Gas from Nigeria, the Authority is compelled to rely on Light Crude Oil (LCO) to run its Thermal Plants. The cost of thermal generation for 2013 is expected to remain high on account of rising crude oil prices thereby increasing the overall cost of thermal generation. This may as well affect the procurement and availability of LCO in running the thermal plants.

5.2 Fuel Price

High crude oil prices projected at an average of US\$119.79/bbl for 2013 with Natural Gas at US\$8.32/mmBtu. This compels the Authority to commit a substantial amount of its revenue to the procurement of Light Crude Oil (LCO) and Natural Gas for electricity generation at both Takoradi Thermal Power Plant and Tema Thermal Power Plant Complexes.

5.3 Breakdown of Generation Facility

POWER PLANT	CAPACITY (MW)
HYDRO GENERATION	
Akosombo	1,020
Kpong	160
Sub-Total	1,180
THERMAL GENERATION	
TAPCO - T1	330
TICO - T2	220
T3	132
Tema Thermal Plant - TT1PP	110
Mines Reserve Plant - MRP	80
Emergency Units - TT2PP	50
Sub-Total	922
Total	2,102

5.4 Expansion of Generation Capacity

- TT1PP Expansion (Steam Portion) – 110MW
- T2 Expansion – 110MW
- T3 Plant Expansion – 172MW

5.5 Reactive Power Compensation

Hydro and Thermal generating units are used to largely meet the reactive need of the demand. Power factor of units are therefore relatively low.

5.6 Auxiliary Energy Consumption

Auxiliary Energy Consumption for 2012 was 35.60 GWh.

5.7 Generation / Transformation Losses

Transmission Losses beyond the benchmarked Losses leads to loss of Revenue to VRA.

5.8 Metering & Accounting

5.9 Billing & Collection

The collection rate for VRA's customers for 2012 was 67.76% and the collection rate excluding ECG for 2012 was 87.67%.

5.10 Organisational Reform & Restructuring

- The Executive pegged its focus Areas on:
 - Portfolio Management
 - Financial Sustainability
 - Commercialization
 - Performance Management
- Merger of the Business Development & Sales Department with the then Finance Department
- Renaming of Accounts Department as Finance Department
- Creation of new Investment Department

- VRA Business Transformation Programme started on January 7, 2013
 - Business Process Re-engineering
 - E-Business Suite (Oracle) Implementation
 - MIS Transformation & IT Infrastructure Refurbishment
 - Replacement of Computron with Hyperion

- Old Appraisal System replaced with the new Balanced Scorecard Target Setting and quarterly Performance Review Report.

- The Human Resources Department introduced
 - Reward Management System Review Project which came up with a new salary grading system - operative now.
 - Performance Management System which rewards on the basis of individual staff, Department and Branch – operative now.
 -

5.11 Customer Complaints & Dispute Resolution

Customer complaints include:

- Power Fluctuations
- Billing Errors
- Lack of reserve for continuous power supply
- Payment of Bills in foreign currencies with respect to Bank of Ghana's directive, banning all transaction in foreign currencies.

5.12 Resolution of Court Cases

5.13 Government & Public Sector Debts

The short to medium term debt profile of VRA as at 31st December 2012 includes:

- GH¢274.33 million short term loans
- GH¢282.69 million medium term loans
- GH¢29.57 million bank overdraft
- GH¢21.79 million interest and commitment charges

5.14 Bad & Doubtful Debts

The Bad & Doubtful Debts for 2012 was GH¢m 35.713.

5.15 Surcharge & Subsidies

5.16 Government Grants

The total government assistance for 2012 was GH¢437,163,000.00.

5.17 Access to Finance & Repayment of Financing Costs

The financing costs in 2012 on loans contracted by VRA totalled GH¢18,735,143.58.

5.18 Tariffs Structure & Rates Design

The tariff proposal is based on average cost pricing. The Bulk Generation Tariff of GH¢0.1929/kWh is a uniform price applied to all kWh of energy produced and is consistent with the accounting criterion of revenue requirement. The tariff is based on total cost of the VRA plus a return on average net fixed assets. Broadly, VRA has two kinds of customers: regulated and deregulated. The rate design for regulated customers is determined by the Public Utilities Regulatory Commission. In the case of deregulated customers, VRA bilaterally negotiates with the customers.

5.19 Introduction of Wholesale Electricity Market

Following the enactment of LI 1937 on Electricity Regulations, VRA engaged certain stakeholders including regulators and customers on the implementation of the Wholesale Electricity Market (WEM). While waiting for the Energy Commission and Ghana Grid Company to develop the market rules for the WEM, VRA and some of the deregulated customers have agreed on a pricing framework.

5.20 Bilateral Bulk Customers Embedded in Distribution Network

Currently, VRA does not have customers embedded in the distribution network. GHACEM Ltd which is embedded in the ECG distribution network, however, has requested VRA to supply power to its facilities.

5.21 Embedded Generators & Interconnection

VRA continues to exchange power with CIE with the purpose of meeting emergency load and stabilising the power system. During the December 2012 election, for example, VRA requested CIE to supply power to meet the domestic demand for electricity.

5.22 Power Procurement from IPPs & Renewable Energy Sources

As a way of diversifying the sources of electricity generation, VRA has constructed a 2MW Solar Plant at Navrongo.

5.23 Human Resource (Skilled Manpower)

VRA has instituted a comprehensive training programme to develop and motivate staff.

5.24 Transmission Constraints & Automatic Load Curtailment

5.25 Others (Specify)

6 Strategies to Address Key Challenges

7 AKOSOMBO HYDRO GENERATION

7.1 Projected Generation Data

Table-1 Summary of Generating Station Data 2011-2015

Parameter	2011	2012	2013	2014	2015
Gross Generation Capacity	1020	1020	1020	1020	1020
Name Plate Power Factor	0.95	0.95	0.95	0.95	0.95
Net Effective / Dependable Generation Capacity	900	900	900	900	900
Projected Energy Generated	6494.4	6949.52	6041.03	4415.00	4415.00
Target Availability of Power Plant	94%	94%	92%	94%	94%

7.2 Capital Expenditure

For purposes of tariff application, the Generating Company must provide generation augmentation plan based on Load Growth Forecast during the tariff review period, which in this case is 2013-2015. The same is required for computation of Revenue Requirement (RR), indicating projected amount of electricity to be generated taking into consideration, estimated growth plan of its customers and any plans of new generation facilities.

The capital investment plan to be submitted by the generating company must contain details of ongoing projects as well as new projects beyond the tariff period.

The generating company must submit Renovation and Modernisation (R&M) **plans** for purposes of extension of asset life beyond its useful life. Detailed project reports indicating scope, justification, cost– benefit analysis, estimated life extension from a reference date, financial package, phasing of expenditure and schedule of completion.

With respect to Annual Performance Review, the generating company must submit capital expenditure incurred and capitalisation during the year under review along side Annual Performance Review.

Outline of the Capital Investment Plan must include but not limited to the following:

- Purpose of Capital Investment Plan
- Replacement of existing assets with a view to meeting load growth, transformation losses, reactive power generation, improvement in quality and reliability of supply
- Capital Structure
- Capitalisation Schedule
- Financing Plan
- Cost – benefit analysis
- Performance improvement envisaged during tariff period

Table- 2 Capital Investment Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
	GHS Million	GHS Million	GHS Million	GHS Million	GHS Million
Capital Cost	-	-	-	-	-
Initial Spares	-	-	3.03	-	-
Additional Capitalisation	-	-	3.17	-	-
Renovation & Modernisation (R&M)	-	-	9.39	-	-
Rehabilitation & Resettlement (R & R)	-	-	13.81	1.36	-

7.3 Capital Expenditure Financing Plan

Table-3 Capital Expenditure Financing Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Accumulated Depreciation	-	-	-	-	-
Retained Earnings	-	32.51	-	-	-
Commercial Borrowings:	-	-	-	-	-
Domestic	-	-	20.53	1.36	-
Foreign	-	-	8.87	-	-
Additional Equity Contribution By Shareholder(s)	-	-	-	-	-
Grants:	-	-	-	-	-
Domestic	-	-	-	-	-
Foreign	-	-	-	-	-
Tariff Revenue (Revenue from Projected Capacity Charge)	-	-	-	-	-

7.4 Operation & Maintenance Costs

Table 4 Operation and Maintenance Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	10.81	2.28	4.48	4.72	5.14

7.5 Administration & General Costs

Table-5 Administration and General Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	7.36	13.48	12.10	10.64	11.60

7.6 Human Resource Costs (Employee Costs)

Table-6 Human Resource Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	43.42	53.21	76.40	71.28	111.61

7.7 Public Education

Table-7 Summary of Public Education Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Stakeholder Communication & Sensitisation (Public Education)	0.152	0.160	0.178	0.196	0.216

7.8 Financing and Interest Costs:

Table-8 Financing and Interest Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Interest on Foreign Loans	-	-	-	-	-
Interest on Domestic Loans	-	-	-	-	-
Interest on Working Capital Loan	-	-	-	-	-

7.9 Return on Equity

Table-9 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	8%	8%	8%	8%	8%

7.10 Depreciation

Table-10 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	n/a	n/a	n/a	n/a	n/a

7.11 Projected Electricity Generation Revenue Requirement:

Table- 11 Summary of Akosombo Hydro Generating Station Revenue Requirement (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Capital Recovery Component (CRC)	n/a	n/a	n/a	n/a	n/a
Fixed O & M Component (FOMC)	n/a	n/a	n/a	n/a	n/a
Non-Fuel Variable Operating Component (NFVOC)	n/a	n/a	n/a	n/a	n/a
Fuel Cost Recovery Component (FCRC)	n/a	n/a	n/a	n/a	n/a
Reactive Power Compensation Component (RPCC)	n/a	n/a	n/a	n/a	n/a

8 KPONG HYDRO GENERATION

8.1 Projected Generation Data

Table-12 Summary of Generating Station Data 2011-2015

Parameter	2011	2012	2013	2014	2015
Gross Generation Capacity	160	160	160	160	160
Name Plate Power Factor	0.9	0.9	0.9	0.9	0.9
Net Effective / Dependable Generation Capacity	140	140	140	140	140
Projected Energy Generated	1066.72	1121.13	1059.09	885	885
Target Availability of Power Plant	90%	94%	94%	90%	90%

8.2 Capital Expenditure

Table-13 Capital Investment Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Capital Cost	-	-	-	-	-
Initial Spares	-	-	0.53	-	-
Additional Capitalisation	-	32.30	3.17	-	-
Renovation & Modernisation (R&M)	-	6.13	46.5	45.18	2.49
Rehabilitation & Resettlement (R & R)	-	-	7.10	30.78	7.23

8.3 Capital Expenditure Financing Plan

Table-12 Capital Expenditure Financing Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Accumulated Depreciation	-	-	-	-	-
Retained Earnings	-	6.13	-	-	-
Commercial Borrowings:	-	-	-	-	-
Domestic	-	-	19.34	30.78	7.23
Foreign	-	-	33.41	-	-
Additional Equity Contribution By Shareholder(s)	-	-	-	-	-
Grants:	-	-	-	-	-
Domestic	-	-	-	-	-
Foreign	-	-	-	-	-
Tariff Revenue (Revenue from Projected Capacity Charge)	-	-	-	-	-

8.4 Operation & Maintenance Costs

Table-13 Operation and Maintenance Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	0.37	1.74	0.79	0.95	1.03

8.5 Administration & General Costs

Table-14 Administration and General Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	1.07	1.96	2.12	2.13	2.33

8.6 Human Resource Costs (Employee Costs)

Table-15 Human Resource Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	11.12	13.26	13.39	14.29	22.37

8.7 Public Education

Table-16 Summary of Public Education Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Stakeholder Communication & Sensitisation (Public Education)	0.057	0.060	0.067	0.074	0.081

8.8 Financing and Interest Costs

Table-17 Financing and Interest Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Interest on Foreign Loans	n/a	n/a	n/a	n/a	n/a
Interest on Domestic Loans	n/a	n/a	n/a	n/a	n/a
Interest on Working Capital Loan	n/a	n/a	n/a	n/a	n/a

8.9 Return on Equity

Table-18 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	8%	8%	8%	8%	8%

8.10 Depreciation

Table-19 Equity Financing Costs (%) 2011-2015

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Item	2011	2012	2013	2014	2015
Rate of Return	n/a	n/a	n/a	n/a	n/a

8.11 Projected Electricity Generation Revenue Requirement:

**Table-20 Summary of Kpong Hydro Generating Station Revenue Requirement
(Million GHS) 2011-2015**

Item	2011	2012	2013	2014	2015
Capital Recovery Component (CRC)	n/a	n/a	n/a	n/a	n/a
Fixed O & M Component (FOMC)	n/a	n/a	n/a	n/a	n/a
Non-Fuel Variable Operating Component (NFVOC)	n/a	n/a	n/a	n/a	n/a
Fuel Cost Recovery Component (FCRC)	n/a	n/a	n/a	n/a	n/a
Reactive Power Compensation Component (RPCC)	n/a	n/a	n/a	n/a	n/a

9 TAPCo THERMAL GENERATION

9.1 Projected Generation Data

Table-21 Summary of Generating Station Data 2011-2015

Parameter	2011	2012	2013	2014	2015
Gross Generation Capacity	330	330	330	330	330
Name Plate Power Factor	0.85	0.85	0.85	0.85	0.85
Net Effective / Dependable Generation Capacity	200	300	300	300	300
Projected Energy Generated	1130	1061.31	2100.91	2102.4	2102.4
Target Availability of Power Plant	80%	80%	80%	80%	80%

9.2 Capital Expenditure

Table-22 Capital Investment Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Capital Cost	-	-	-	-	-
Initial Spares	-	-	0.1	4.52	3.61
Additional Capitalisation	-	-	11.94	32.28	12.55
Renovation & Modernisation (R&M)	-	0.01	6.22	8.47	17.13
Rehabilitation & Resettlement (R & R)	-	-	-	-	-

9.3 Capital Expenditure Financing Plan

Table-23 Capital Expenditure Financing Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Accumulated Depreciation	-	-	-	-	-
Retained Earnings	-	0.01	77.66	45.27	33.29
Commercial Borrowings:	-	-	-	-	-
Domestic	-	-	-	-	-
Foreign	-	-	-	-	-
Additional Equity Contribution By Shareholder(s)	-	-	-	-	-
Grants:	-	-	-	-	-
Domestic	-	-	-	-	-
Foreign	-	-	-	-	-
Tariff Revenue (Revenue from Projected Capacity Charge)	-	-	-	-	-

9.4 Operation & Maintenance Costs

Table-24 Operation and Maintenance Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	16.19	20.86	16.99	13.76	15.00

9.5 Administration & General Costs

Table-25 Administration and General Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	2.49	7.44	9.29	8.55	9.32

9.6 Human Resource Costs (Employee Costs)

Table-26 Human Resource Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	17.93	20.79	41.10	41.40	64.82

9.7 Public Education

Table-27 Summary of Public Education Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Stakeholder Communication & Sensitisation (Public Education)	0.114	0.120	0.133	0.147	0.162

9.8 Financing and Interest Costs

Table-28 Financing and Interest Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Interest on Foreign Loans	n/a	n/a	n/a	n/a	n/a
Interest on Domestic Loans	n/a	n/a	n/a	n/a	n/a
Interest on Working Capital Loan	n/a	n/a	n/a	n/a	n/a

9.9 Return on Equity

Table-29 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	16%	16%	16%	16%	16%

9.10 Depreciation

Table-30 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	n/a	n/a	n/a	n/a	n/a

9.11 Projected Electricity Generation Revenue Requirement:

Table-31 Summary of TAPCo Revenue Requirement (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Capital Recovery Component (CRC)	n/a	n/a	n/a	n/a	n/a
Fixed O & M Component (FOMC)	n/a	n/a	n/a	n/a	n/a
Non-Fuel Variable Operating Component (NFVOC)	n/a	n/a	n/a	n/a	n/a
Fuel Cost Recovery Component (FCRC)	n/a	n/a	n/a	n/a	n/a
Reactive Power Compensation Component (RPCC)	n/a	n/a	n/a	n/a	n/a

10 TICO THERMAL GENERATION

10.1 Projected Generation Data

Table-32 Summary of Generating Station Data 2011-2015

Parameter	2011	2012	2013	2014	2015
Gross Generation Capacity	220	220	220	220	330
Name Plate Power Factor	1.70	1.70	1.70	1.70	2.55
Net Effective / Dependable Generation Capacity	200	200	200	200	300
Projected Energy Generated	656.62	1167.761	1350.62	1489.2	2233.8
Target Availability of Power Plant	85%	85%	85%	85%	85%

10.2 Capital Expenditure

Table-33 Capital Investment Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Capital Cost	-	-	-	-	-
Initial Spares	-	-	-	-	-
Additional Capitalisation	-	-	-	-	-
Renovation & Modernisation (R&M)	-	-	-	-	-
Rehabilitation & Resettlement (R & R)	-	-	-	-	-

10.3 Capital Expenditure Financing Plan

Table-34 Capital Expenditure Financing Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Accumulated Depreciation	-	-	-	-	-
Retained Earnings	-	-	-	-	-
Commercial Borrowings:	-	-	-	-	-
Domestic	-	-	-	-	-
Foreign	-	-	-	-	-
Additional Equity Contribution By Shareholder(s)	-	-	-	-	-
Grants:	-	-	-	-	-
Domestic	-	-	-	-	-
Foreign	-	-	-	-	-
Tariff Revenue (Revenue from Projected Capacity Charge)	-	-	-	-	-

10.4 Operation and Maintenance Costs

Table 35 Operation and Maintenance Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed O & M Costs	n/a	n/a	n/a	n/a	n/a
Variable O & M Cost	n/a	n/a	n/a	n/a	n/a

10.5 Administration and General Costs

Table-36 Administration and General Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed O & M Costs	n/a	n/a	n/a	n/a	n/a
Variable O & M Cost	n/a	n/a	n/a	n/a	n/a

10.6 Human Resource Costs (Employee Costs)

Table-37 Human Resource Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed O & M Costs	n/a	n/a	n/a	n/a	n/a
Variable O & M Cost	n/a	n/a	n/a	n/a	n/a

10.7 Public Education

Table-38 Summary of Public Education Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Stakeholder Communication & Sensitisation (Public Education)	n/a	n/a	n/a	n/a	n/a

10.8 Financing and Interest Costs

Table-39 Financing and Interest Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Interest on Foreign Loans	n/a	n/a	n/a	n/a	n/a
Interest on Domestic Loans	n/a	n/a	n/a	n/a	n/a
Interest on Working Capital Loan	n/a	n/a	n/a	n/a	n/a

10.9 Return on Equity

Table-40 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	16%	16%	16%	16%	16%

10.10 Depreciation

Table-41 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	n/a	n/a	n/a	n/a	n/a

10.11 Projected Electricity Generation Revenue Requirement:

Table-42 Summary of TCo Revenue Requirement (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Capital Recovery Component (CRC)	n/a	n/a	n/a	n/a	n/a
Fixed O & M Component (FOMC)	n/a	n/a	n/a	n/a	n/a
Non-Fuel Variable Operating Component (NFVOC)	n/a	n/a	n/a	n/a	n/a
Fuel Cost Recovery Component (FCRC)	n/a	n/a	n/a	n/a	n/a
Reactive Power Compensation Component (RPCC)	n/a	n/a	n/a	n/a	n/a

11 TT1PP THERMAL GENERATION

11.1 Projected Generation Data

Table-43 Summary of Generating Station Data 2011-2015

Parameter	2011	2012	2013	2014	2015
Gross Generation Capacity	110	110	110	110	110
Name Plate Power Factor	0.8	0.8	0.8	0.8	0.8
Net Effective / Dependable Generation Capacity	100	100	100	100	100
Projected Energy Generated	557.74	622.24	744.56	744.6	744.6
Target Availability of Power Plant	85%	85%	85%	85%	85%

11.2 Capital Expenditure

Table-44 Capital Investment Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Capital Cost	-	-	-	-	-
Initial Spares	-	-	-	-	-
Additional Capitalisation	-	11.05	-	-	-
Renovation & Modernisation (R&M)	-	0.12	0.42	293.65	240.93
Rehabilitation & Resettlement (R & R)	-	-	6.28	-	-

11.3 Capital Expenditure Financing Plan

Table-45 Capital Expenditure Financing Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Accumulated Depreciation	-	-	-	-	-
Retained Earnings	-	11.17	-	-	-
Commercial Borrowings:	-	-	-	-	-
Domestic	-	-	6.28	-	-
Foreign	-	-	0.42	293.65	240.93
Additional Equity Contribution By Shareholder(s)	-	-	-	-	-
Grants:	-	-	-	-	-
Domestic	-	-	-	-	-
Foreign	-	-	-	-	-
Tariff Revenue (Revenue from Projected Capacity Charge)	-	-	-	-	-

11.4 Operation & Maintenance Costs

Table-46 Operation and Maintenance Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	7.83	12.73	6.02	4.88	5.32

11.5 Administration & General Costs

Table-47 Administration and General Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	1.34	4.57	3.59	3.37	3.67

11.6 Human Resource Costs (Employee Costs)

Table-48 Human Resource Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	8.04	10.14	14.57	14.67	22.97

11.7 Public Education

Table 49 Summary of Public Education Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Stakeholder Communication & Sensitisation (Public Education)	0.019	0.020	0.022	0.025	0.027

11.8 Financing and Interest Costs

Table-50 Financing and Interest Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Interest on Foreign Loans	n/a	n/a	n/a	n/a	n/a
Interest on Domestic Loans	n/a	n/a	n/a	n/a	n/a
Interest on Working Capital Loan	n/a	n/a	n/a	n/a	n/a

11.9 Return on Equity

Table-51 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	16%	16%	16%	16%	16%

11.10 Depreciation

Table-52 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	n/a	n/a	n/a	n/a	n/a

11.11 Projected Electricity Generation Revenue Requirement:

Table-53 Summary of TT1PP Revenue Requirement (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Capital Recovery Component (CRC)	n/a	n/a	n/a	n/a	n/a
Fixed O & M Component (FOMC)	n/a	n/a	n/a	n/a	n/a
Non-Fuel Variable Operating Component (NFVOC)	n/a	n/a	n/a	n/a	n/a
Fuel Cost Recovery Component (FCRC)	n/a	n/a	n/a	n/a	n/a
Reactive Power Compensation Component (RPCC)	n/a	n/a	n/a	n/a	n/a

12 TT2PP THERMAL GENERATION

12.1 Projected Generation Data

Table-54 Summary of Generating Station Data 2011-2015

Parameter	2011	2012	2013	2014	2015
Gross Generation Capacity	49.5	49.5	49.5	49.5	49.5
Name Plate Power Factor	4.5	4.5	4.5	4.5	4.5
Net Effective / Dependable Generation Capacity	45	45	45	45	45
Projected Energy Generated	49.08	140.53	223.79	335.00	335.00
Target Availability of Power Plant	85%	85%	85%	85%	85%

12.2 Capital Expenditure

Table-55 Capital Investment Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Capital Cost	-	-	-	-	-
Initial Spares	-	-	2.51	-	-
Additional Capitalisation	-	0.06	-	-	-
Renovation & Modernisation (R&M)	-	-	-	-	-
Rehabilitation & Resettlement (R & R)	-	-	-	-	-

12.3 Capital Expenditure Financing Plan

Table-56 Capital Expenditure Financing Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Accumulated Depreciation	-	-	-	-	-
Retained Earnings	-	3.19	-	-	-
Commercial Borrowings:	-	-	-	-	-
Domestic	-	-	10.88	12.2	-
Foreign	-	-	-	-	-
Additional Equity Contribution By Shareholder(s)	-	-	-	-	-
Grants:	-	-	-	-	-
Domestic	-	-	-	-	-
Foreign	-	-	-	-	-
Tariff Revenue (Revenue from Projected Capacity Charge)	-	-	-	-	-

12.4 Operation & Maintenance Costs

Table-57 Operation and Maintenance Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	0.68	2.36	1.81	2.19	2.39

12.5 Administration & General Costs

Table- 58 Administration and General Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	0.12	0.85	1.08	1.52	1.65

12.6 Human Resource Costs (Employee Costs)

Table-59 Human Resource Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	2.75	3.93	4.38	6.60	10.33

12.7 Public Education

Table-60 Summary of Public Education Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Stakeholder Communication & Sensitisation (Public Education)	0.019	0.020	0.022	0.025	0.027

12.8 Financing and Interest Costs:

Table-61 Financing and Interest Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Interest on Foreign Loans	n/a	n/a	n/a	n/a	n/a
Interest on Domestic Loans	n/a	n/a	n/a	n/a	n/a
Interest on Working Capital Loan	n/a	n/a	n/a	n/a	n/a

12.9 Return on Equity

Table-62 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	16%	16%	16%	16%	16%

12.10 Depreciation

Table-63 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	n/a	n/a	n/a	n/a	n/a

12.11 Projected Electricity Generation Revenue Requirement:

Table-64 Summary of TT2PP Revenue Requirement (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Capital Recovery Component (CRC)	n/a	n/a	n/a	n/a	n/a
Fixed O & M Component (FOMC)	n/a	n/a	n/a	n/a	n/a
Non-Fuel Variable Operating Component (NFVOC)	n/a	n/a	n/a	n/a	n/a
Fuel Cost Recovery Component (FCRC)	n/a	n/a	n/a	n/a	n/a
Reactive Power Compensation Component (RPCC)	n/a	n/a	n/a	n/a	n/a

13 MRP THERMAL GENERATION

13.1 Projected Generation Data

Table-65 Summary of Generating Station Data 2011-2015

Parameter	2011	2012	2013	2014	2015
Gross Generation Capacity	80	80	80	80	80
Name Plate Power Factor	2.65	2.65	2.65	2.65	2.65
Net Effective / Dependable Generation Capacity	40	40	40	70	70
Projected Energy Generated	12.61	19.645	0	459.9	459.9
Target Availability of Power Plant	75%	75%	75%	75%	75%

13.2 Capital Expenditure

Table-66 Capital Investment Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Capital Cost	-	-	-	-	-
Initial Spares	-	-	-	-	-
Additional Capitalisation	-	-	-	-	-
Renovation & Modernisation (R&M)	-	-	14.36	13.3	1.18
Rehabilitation & Resettlement (R & R)	-	-	-	-	-

13.3 Capital Expenditure Financing Plan

Table-67 Capital Expenditure Financing Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Accumulated Depreciation	-	-	-	-	-
Retained Earnings	-	-	-	-	-
Commercial Borrowings:	-	-	-	-	-
Domestic	-	-	14.36	13.3	1.18
Foreign	-	-	-	-	-
Additional Equity Contribution By Shareholder(s)	-	-	-	-	-
Grants:	-	-	-	-	-
Domestic	-	-	-	-	-
Foreign	-	-	-	-	-
Tariff Revenue (Revenue from Projected Capacity Charge)	-	-	-	-	-

13.4 Operation & Maintenance Costs

Table-68 Operation and Maintenance Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	0.21	0.34	-	3.01	3.28

13.5 Administration & General Costs

Table-69 Administration and General Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	0.04	0.12	-	2.08	2.27

13.6 Human Resource Costs (Employee Costs)

Table-70 Human Resource Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	1.71	2.36	-	9.06	14.19

13.7 Public Education

Table- 71 Summary of Public Education Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Stakeholder Communication & Sensitisation (Public Education)	0.019	0.020	0.022	0.025	0.027

13.8 Financing and Interest Costs

Table-72 Financing and Interest Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Interest on Foreign Loans	n/a	n/a	n/a	n/a	n/a
Interest on Domestic Loans	n/a	n/a	n/a	n/a	n/a
Interest on Working Capital Loan	n/a	n/a	n/a	n/a	n/a

13.9 Return on Equity

Table-73 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	16%	16%	16%	16%	16%

13.10 Depreciation

Table-74 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	n/a	n/a	n/a	n/a	n/a

13.11 Projected Electricity Generation Revenue Requirement:

Table-75 Summary of MRP Revenue Requirement (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Capital Recovery Component (CRC)	n/a	n/a	n/a	n/a	n/a
Fixed O & M Component (FOMC)	n/a	n/a	n/a	n/a	n/a
Non-Fuel Variable Operating Component (NFVOC)	n/a	n/a	n/a	n/a	n/a
Fuel Cost Recovery Component (FCRC)	n/a	n/a	n/a	n/a	n/a
Reactive Power Compensation Component (RPCC)	n/a	n/a	n/a	n/a	n/a

14 T₃ THERMAL GENERATION

14.1 Projected Generation Data

Table-76 Summary of Generating Station Data 2011-2015

Parameter	2011	2012	2013	2014	2015
Gross Generation Capacity	-	-	132	132	132
Name Plate Power Factor	-	-	4	4	4
Net Effective / Dependable Generation Capacity	-	-	120	120	120
Projected Energy Generated	-	-	255.00	893.52	893.52
Target Availability of Power Plant	-	-	85%	85%	85%

14.2 Capital Expenditure

Table-777 Capital Investment Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Capital Cost	-	-	-	-	-
Initial Spares	-	-	-	-	-
Additional Capitalisation	-	4.31	-	-	-
Renovation & Modernisation (R&M)	-	-	60.37	253.26	253.59
Rehabilitation & Resettlement (R & R)	-	-	-	-	-

14.3 Capital Expenditure Financing Plan

Table-788 Capital Expenditure Financing Plan (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Accumulated Depreciation	-	-	-	-	-
Retained Earnings	-	4.13	-	-	-
Commercial Borrowings:	-	-	-	-	-
Domestic	-	-	-	-	-
Foreign	-	-	-	-	-
Additional Equity Contribution By Shareholder(s)	-	-	-	-	-
Grants:	-	-	-	-	-
Domestic	-	-	-	-	-
Foreign	-	-	-	-	-
Tariff Revenue (Revenue from Projected Capacity Charge)	-	-	60.37	253.26	272.86

14.4 Operation & Maintenance Costs

Table-79 Operation and Maintenance Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	-	-	0.00215	0.00046	0.00038

14.5 Administration & General Costs

Table- 80 Administration and General Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	-	0.00	1.23	4.05	4.41

14.6 Human Resource Costs (Employee Costs)

Table-81 Human Resource Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Fixed & Variable O&M Cost	-	0.003	4.989	17.608	27.568

14.7 Public Education

Table-82 Summary of Public Education Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Stakeholder Communication & Sensitisation (Public Education)	n/a	n/a	n/a	n/a	n/a

14.8 Financing and Interest Costs

Table-83 Financing and Interest Costs (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Interest on Foreign Loans	n/a	n/a	n/a	n/a	n/a
Interest on Domestic Loans	n/a	n/a	n/a	n/a	n/a
Interest on Working Capital Loan	n/a	n/a	n/a	n/a	n/a

14.9 Return on Equity

Table-84 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	16%	16%	16%	16%	16%

14.10 Depreciation

Table-85 Equity Financing Costs (%) 2011-2015

Item	2011	2012	2013	2014	2015
Rate of Return	n/a	n/a	n/a	n/a	n/a

14.11 Projected Electricity Generation Revenue Requirement:

Table- 86 Summary of T3 Revenue Requirement (Million GHS) 2011-2015

Item	2011	2012	2013	2014	2015
Capital Recovery Component (CRC)	n/a	n/a	n/a	n/a	n/a
Fixed O & M Component (FOMC)	n/a	n/a	n/a	n/a	n/a
Non-Fuel Variable Operating Component (NFVOC)	n/a	n/a	n/a	n/a	n/a
Fuel Cost Recovery Component (FCRC)	n/a	n/a	n/a	n/a	n/a
Reactive Power Compensation Component (RPCC)	n/a	n/a	n/a	n/a	n/a

15 Summary of Projected Energy Generation By Power Plant

Table-87 Projected Electricity Generation 2011-2015

Generating Station/Plant	Gross Generation Capacity	Name Plate Power / Capacity Factor	Net Effective / Dependable Generation Capacity	Projected Energy Generated
Hydro:				
Akosombo Generating Station	1020	0.95	900	28,314.95
Kpong Generating Station	160	0.9	140	5016.94
Sub Total	1180	1.85	1040	33,331.89
Thermal:				
TAPCo	330	0.85	300	8,497.02
TICo	220	2.55	300	6,898.001
TT1PP	110	0.8	100	3,413.74
TT2PP	50	4.5	45	1,083.4
MRP	80	2.65	70	952.055
T3	132	4	120	2,042.04
TOTAL	922	15.35	935	22,886.256

16 Reactive Power Parameters

16.1 Name Plate Information

Item	Total No of Units	Unit 1	Unit 2	Unit 3
Generator Data	n/a	n/a	n/a	n/a
Name Plate Capacity	n/a	n/a	n/a	n/a
Rated Power Factor	n/a	n/a	n/a	n/a
Exciter Data	n/a	n/a	n/a	n/a
Name Plate Rating	n/a	n/a	n/a	n/a

16.2 Ancillary Electrical Equipment (Common)

Item	Acquisition Value	Net Book Value
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Power Plant electrical and control equipment	n/a	n/a
Sub Total	n/a	n/a

16.3 Generator Unit 1 Ancillary Equipment

16.3.1 Generator Unit 1

Item	Acquisition Value	Net Book Value
Generator equipment	n/a	n/a
Hydrogen Cooler & Cooler Changer	n/a	n/a
Rewind Generator	n/a	n/a
Sub Total	n/a	n/a

16.3.2 Exciter for Generator Unit 1

Item	Acquisition Value	Net Book Value
Unit 1 Generator Equipment	n/a	n/a
	n/a	n/a
Sub Total	n/a	n/a

16.3.3 Step-Up Transformer for Generator Unit 1

Item	Acquisition Value	Net Book Value
Main Transformer Firewalls, Lightning Arrestors	n/a	n/a
Transformer Restore Spare Transformer	n/a	n/a
Electrical & Control equipment – Transmission	n/a	n/a
Sub Total	n/a	n/a

16.3.4 Ancillary Electrical Equipment for Generator Unit 1

Item	Acquisition Value	Net Book Value
Replace Controls	n/a	n/a
Turnaround – Auto Transfer Switch	n/a	n/a
Replace Load Center Transformation	n/a	n/a
Electrical & Control Equipment	n/a	n/a
Sub Total	n/a	n/a

16.4 Generator Unit 2 Ancillary Equipment

16.4.1 Generator Unit 2

Item	Acquisition Value	Net Book Value
Generator equipment	n/a	n/a
Hydrogen Cooler & Cooler Changer	n/a	n/a
Rewind Generator	n/a	n/a
	n/a	n/a
Sub Total	n/a	n/a

16.4.2 Exciter for Generator Unit 2

Item	Acquisition Value	Net Book Value
Unit 1 Generator Equipment	n/a	n/a
	n/a	n/a
Sub Total	n/a	n/a

16.4.3 Step-Up Transformer for Generator Unit 2

Item	Acquisition Value	Net Book Value
Main Transformer Firewalls, Lightning Arrestors	n/a	n/a
Transformer Restore Spare Transformer	n/a	n/a
Electrical & Control equipment – Transmission	n/a	n/a
	n/a	n/a
Sub Total	n/a	n/a

16.4.4 Ancillary Electrical Equipment for Generator Unit 2

Item	Acquisition Value	Net Book Value
Replace Controls	n/a	n/a
Turnaround – Auto Transfer Switch	n/a	n/a
Replace Load Centre Transformation	n/a	n/a
Electrical & Control Equipment	n/a	n/a
Sub Total	n/a	n/a