



# PURC

PUBLIC UTILITIES REGULATORY COMMISSION

ANNUAL REPORT  
2016-2017

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***Mission Statement***

*To build a credible and sustainable utility regulatory regime  
that protects stakeholders' interests.*

***Vision Statement***

*A model utility regulatory institution in Africa*

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# The Commission (Appointed November 2017)

## Chairman

Mr. Michael Opam

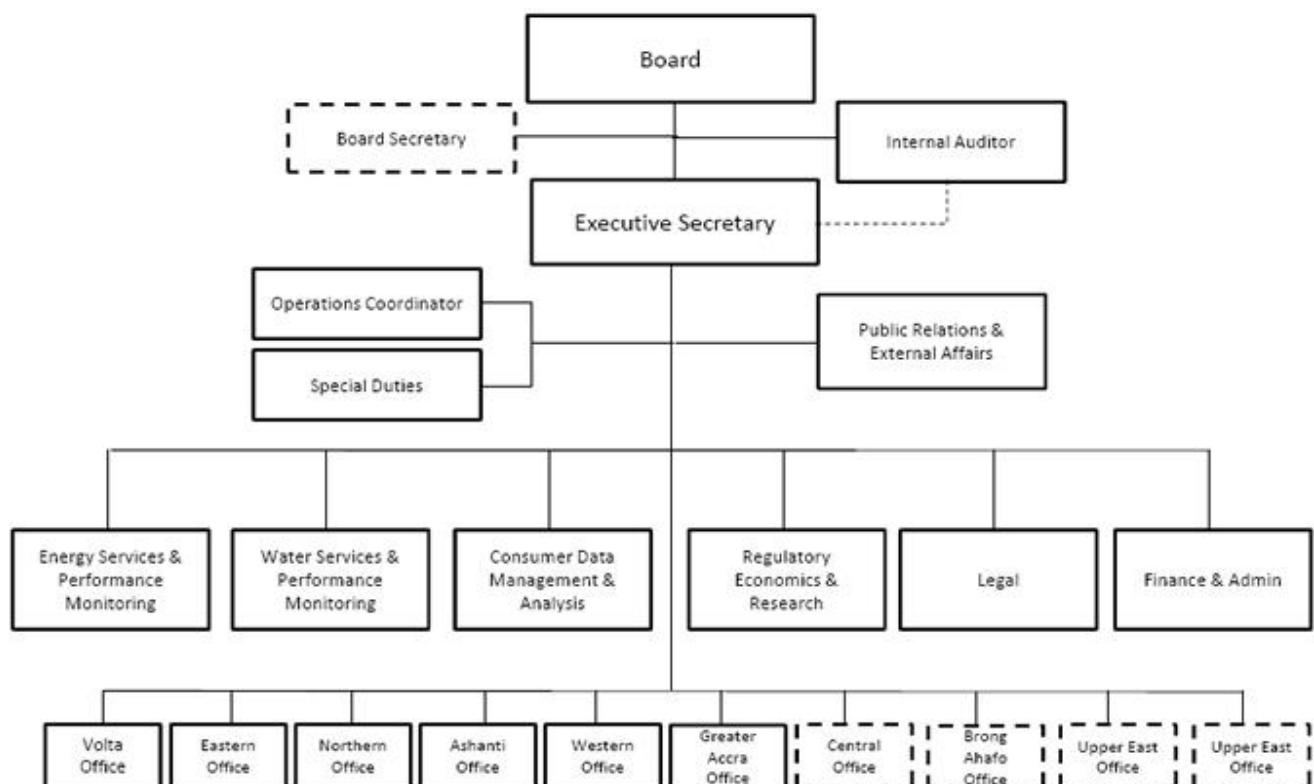
## Executive Secretary

Mrs. Mami Dufie Ofori

## Commissioners

Prof. Joe Amoako-Tuffour  
Mr. Emmanuel Sekor  
Mr. Ishmael Edjekumhene  
Mrs. Dora Oppong  
Mr. Ebo B. Quagrainie  
Mr. Daniel Owusu-Koranteng  
Dr. Yaw Adu Gyamfi

## Secretariat



## **Profile of the Public Utilities Regulatory Commission (PURC)**

The Commission was established under the Public Utilities Regulatory Commission Act, 1997 (Act 538) to regulate and oversee the provision of public utility services. A public utility is defined in section 49 of the Act as:

“any person engaged in the provision for a fee, whether directly or indirectly, of any of the following services to the public -

- a. the supply, transmission or distribution of electricity;
- b. the supply, transmission or distribution of water;
- c. such other public utility services excluding a service involving or related to a petroleum product, that the Commission shall by legislative instrument prescribe on recommendation of the Minister with responsibility for the service”

The law also provides modalities for expansion of the scope of utility services regulated by the Commission. Consequently under the Energy Commission Act 1997 (Act 541), PURC is further mandated to regulate aspects of the Natural Gas Industry. Operations of community water systems are however specifically excluded from the Commission’s purview.

The Commission comprises nine members - a Chairman, an Executive Secretary, a representative each of the Trades Union Congress, the Association of Ghana Industries and Domestic Consumers, as well as four other persons knowledgeable in matters relevant to the functions of the Commission. Members of the Commission are appointed for up to five years by the President under Article 70 of the 1992 Constitution of Ghana.

The work of the Commission is organised through committees comprised of Commissioners, external experts, and Secretariat staff. The committees are responsible for in-depth analysis of matters referred by the Commission, review of reports and submission of recommendations to the Commission for approval and implementation. The committees are: Technical Committee, Finance and Administrative Committee (F&A), Legal, Complaints & Dispute Resolution Committee, and Stakeholder Management & Communication Committee. Statutory committees are the Entity Tender Committee (ETC) and the Audit Committee.

The Commission is supported by a Secretariat of Engineers/Technical staff, Economists, Financial Analysts, Legal Service staff, Customer Service staff and other support staff. Currently, PURC has offices in six of the ten regions of Ghana. As part of a decentralization plan, the Commission intends to establish an office in each region of the country.

The core functions of the Commission are

- (i) to approve rates chargeable for provision of utility services;
- (ii) to protect the interests of consumers and providers of utility services;
- (iii) to monitor the compliance of utility companies with standards of performance established by licensing authorities; and
- (iv) to promote fair competition among public utilities.

The Commission also resolves complaints related to the provision of utility services through mediation and formal hearing. The Commission has rule making powers and has issued subsidiary legislation to enhance consumer protection in the provision of utility services.

By virtue of Section 4 of Act 538, the Commission is an independent body and is not subject to the direction or control of any person or authority in the performance of its functions. However, in addition to having institutional representation on the Commission, PURC places a premium on its extensive stakeholder consultations in decision making. Indeed, the Commission is enjoined by law, in its regulatory policy and good regulatory practice to take account of representations made to it by consumers before approving any major rates. Additionally, PURC is statutorily required to submit audited statement of accounts and reports of its operations on yearly basis to the Parliament of Ghana and also reports to the Office of the President

### **Relations with Statutory Institutions and other Stakeholders**

In delivering on its mandate, the Commission has official working relations with entities within the energy and water sectors of Ghana as well as other institutions whose work impact that of the Commission. These institutions include the Ministry of Energy, Ministry for Sanitation and Water Resources, Energy Commission, Volta River Authority, Ghana Grid Company, Electricity Company of Ghana, Northern Electricity Distribution Company, Ghana National Gas Company, Ghana Water Company Limited, Water Resources Commission, Independent Power Producers, Independent Water Producers, Ghana Statistical Service, Bank of Ghana, Trades Union Congress, Association of Ghana Industries and consumers.

## **Association with Regional Bodies**

PURC is a member of the African Forum for Utility Regulators (AFUR), a body which aims at promoting good regulatory policies or practices on the African continent. The Commission sits on the Executive Committee of this august body. The Commission is also a member of a sub-regional electricity body, the ECOWAS Regional Electricity Regulatory Authority (ERERA), which aims at developing sound technical policies for the electricity sector in the West African sub-region.

## **Commissioners in Office 2016 – November 2017**

### **Chairman**

Dr. Emmanuel K. Annan

### **Commissioners**

Mr. Stephen Akuoko

Dr. Yaw Adu Gyamfi

Mr. Daniel Owusu-Koranteng

Dr. Ferdinand D. Tay

Mr. Samuel L. Adetola

Major Albert Don-Chebe (Rtd.)

Mr. David Ametefe

Mr. Samuel Sarpong (Executive Secretary)

## **EXECUTIVE SUMMARY**

The Commission's main operational activities in 2016 -2017 were in the area of tariff setting, utility performance monitoring and consumer protection.

Following the major electricity and water tariff decision of 2015 which came into effect on 14 December 2015, the Commission in 2016-2017 continued to track the movement of cost components within conventional electricity generation, transmission and distribution, feed-in and net metering rates in respect of renewable energy sources, and water production and supply. The Commission decided to maintain the December 2015 rates as favourable hydro and natural gas supply meant that movements in these cost elements could be contained within the approved rates.

Consistent and sustained improvement in the quality of utility service remains a key area of focus for the Commission. In 2016-2017, we observed a marked improvement in the commitment of utility companies to the provision of good services. Increasingly the utility companies are taking an acceptance of the need to benchmark utility service in Ghana to international standards. The Commission maintains that significant improvements can be made with minimal investments which will greatly enhance the customer experience.

In 2016-2017 undertook periodic inspections of water treatment and power generation plants to ascertain their operational efficiency. Electricity transmission facilities, sub-transmission and distribution stations were included in these monitoring exercises all under the Commission's utility performance monitoring mandate. The Commission also undertook a generation and revenue audit of the utility companies in the year 2016. The Commission initiated a concerted effort with utility companies and other agencies to establish a sound framework for inter-utility debt restructuring and guidelines for regulatory audit of procurement by utility service providers. These were all aimed at placing the sector on sound financial footing as a catalyst for development and economic growth.

The Commission undertook a number of field visits to the regulated utilities' customer service points, community monitoring exercises and resolved a number of customer complaints using the Commission's approved complaints resolution procedure and other approved legislative instruments of the Commission. Details of operational activities conducted in 2016-2017 can be found below under the respective sections.

## **TARIFF REGULATION**

### **Quarterly Tariff Reviews**

The Automatic Adjustment Formula (AAF) mechanism is used by the Commission to effect quarterly adjustments to tariffs so as to reflect changes in crude oil prices, Ghana Cedi: US Dollar exchange rate, inflation and the hydro-thermal generation mix. This enables the Commission to maintain the real value of tariffs in between major tariff determinations.

In 2016-2017, seven quarterly AAF reviews were conducted by the Commission and the outcomes gazetted as required by law. For 2016, the review was carried out over all four quarters of the year. The first three quarters of 2017 were reviewed, while that of the last quarter was withheld in anticipation of a major tariff review within the first quarter of 2018. Results from analyses of 2017 reviews indicate on average, marginal increases in end-user tariff for the first three quarters. However, these increases were considered insignificant within the Commission's Automatic Tariff Approval Framework.

Although macroeconomic variables (Ghana Cedi: US Dollar exchange rate and inflation) experienced some positive variations, the effect of these increases on the tariff was mitigated by an increase in the hydro component of the generation mix. Similarly, some power purchase costs for the regulated market were negotiated downwards thus having a positive impact on tariffs. Consequently, the Commission decided to maintain both electricity and water tariffs at the same levels as approved in December 2015. Table-1 and Table-2 below show the approved electricity and water tariffs for 2016 and 2017.

**Table 1: Approved Electricity Tariffs for 2017**

<b>Customer Class</b>	<b>Approved Tariff (GHp/kWh)</b>
<b>Residential</b>	
0-50	33.5586
51-300	67.3273
301-600	87.3777
600+	97.0864
Service Charge	633.1717
<b>Non-Residential</b>	
0-300	96.7909
301-600	102.9959
600+	162.5141
Service Charge	1055.2862
<b>SLT-LV</b>	
Max. Demand (GHp/kVA/month)	5909.6029
Energy Charge (GHp/kWh)	100.8854
Service Charge (GHp/month)	4221.1449
<b>SLT-MV</b>	
Max. Demand (GHp/kVA/month)	5065.3739
Energy Charge (GHp/kWh)	78.0911
Service Charge (GHp/month)	5909.6029
<b>SLT-HV</b>	
Max. Demand (GHp/kVA/month)	5065.3739
Energy Charge (GHp/kWh)	71.7594
Service Charge (GHp/month)	5909.6029
<b>SLT-HV Mines</b>	
Max. Demand (GHp/kVA/month)	5909.6029
Energy Charge (GHp/kWh)	113.9710
Service Charge (GHp/month)	5909.6029

**Table 2: Approved Water Tariffs for 2017**

<b>Category of Service</b>	<b>Approved Rates in GH¢/1000 litres</b>
Metered Domestic	
0-5	298.1720
5 and above	507.3948
Commercial	836.0166
Industrial	1007.0200
Public Institutions/Government	
Departments	650.9074
Premises without connection (Public stand pipes) per 1000 Litres	334.6242
Special Commercial	5078.9159
Sachet Water Producers	1121.0221
GHAPOHA (Internal Usage)	836.0166
GHAPOHA (Ocean Going Vessels)	11400.2250

*NB: Special Commercial refers to bulk customers who use GWCL treated water as the main raw material for bottling water.*

### Feed-in-Tariffs for Renewable Energy

In pursuance of sections 5(a) and 5(c) of the Renewable Energy Act, 2011 (Act 832), the Commission revised the existing Feed-in-Tariffs based on available financial data and changes in renewable energy project costs. The review was also informed by research in technology improvements with respect to electricity generation from renewable energy sources. The feed-in tariff took effect from October 1, 2016.

### Operational Guidelines on Cash Waterfall Mechanism

Following Cabinet approval for the introduction of a Cash Waterfall Mechanism in July 2017, the Commission participated in a Committee comprising representatives from the Ministries of Finance and Energy and other operators in the electricity value chain, to develop guidelines for the mechanism. This is expected to serve as a key tool to ensure equitable and predictable distribution of revenue to all Stakeholders in the electricity value chain. The specific objectives of the guidelines were to:

- (a) ensure the allocation and payment of collected revenue to all utility service providers and fuel suppliers in accordance with approved tariffs allocation system;

- (b) ensure each fuel supplier received their proportion of allocated revenues based on the prior agreed terms; and
- (c) Monitor all regulated and deregulated revenue collections and ensure compliance with the distribution mechanism and operational guidelines.

### **Revenue Audit**

For the year 2016, total projected revenue for the generation sector fell by 40% from GHS5.52 Billion to an actual revenue of GHS3.31 Billion. This position could be attributed to a shortfall in generation from 14,608GWh to 10,552GWh representing a 28% reduction. In 2017, the projected revenue fell from GHS4.02 Billion to GHS2.83 Billion representing 30% reduction in revenue. Similarly, this decline could be attributed to shortfall in generation which fell from 12,023GWh to 9,806GWh for the year 2017.

With respect to electricity transmission in 2016, GRIDCo realised a total transmission revenue of GHS264.5 Million vis-à-vis a revenue projection of GHS366.3 Million. This represents a 27.8% reduction in revenue. In the same year, ECG and NEDCo recorded a combined Distribution Service Revenue of GHS 785.7 Million as against a projected revenue of GHS767.9 Million in terms of Distribution. This implies that the actual revenue realized with respect to Distribution Service Revenues exceeded the target by 2.3%. In 2017, GRIDCo realised Total Transmission Revenue of GHS 446.3 Million whereas ECG and NEDCo recorded a combined Distribution Service Revenue of GHS 1,124.9 Million in the same year, all of which could be attributed to operations and maintenance only.

With regards to water production, transmission and distribution, the Commission's revenue audit indicated that actual billed tariff revenue exceeded the Commission's computed tariff billed revenue by 2% on average. Tariff revenue collection witnessed an improvement in performance moving from as low as 39% in January 2016 to 66% in December 2016. This was however still below the Commission's collection ratio benchmark of 95%, indicating a direct loss to the Ghana Water Company through inefficient revenue collection. Actual revenue for Water Production, Transmission and Distribution in 2017 increased marginally on average by 0.2% than PURC Computed Tariff Billed Revenue. Tariff Revenue Collection on the other hand witnessed an improvement in performance with a Collection Ratio ranging from 63% in January 2017 to 63% in December 2017, compared to PURC Collection Ratio Benchmark of 95%.

### **Inter Utility Debt Restructuring**

In furtherance of the Government's inter-utility debt restructuring of GNGC, VRA, IPPs, GRIDCo, ECG, NEDCo, GWCL and affected local banks, the Commission was tasked to establish the net debt positions of utility service providers using receivables and payables analyses including GoG and corporate loans. It was established that at the end of 2016, the electricity sector net debt position stood at approximately US\$2billion.

### **Rate Setting Guidelines for Electricity Distribution and Supply**

In 2016, the Millennium Development Authority (MiDA) and the International Finance Corporation (IFC) submitted a draft tariff methodology to the Commission as part of preparations for the private concession arrangement in the Electricity Company of Ghana.

Consequently, the Commission in 2017 developed Rate Setting Guidelines for Electricity Distribution and Supply specifically for the ECG Private Sector Participation (PSP). This was intended to provide PURC with a tailored framework for regulating financial and economic operational activities of the Concessionaire. Two volumes were developed as part of PURC's Guidelines for Electricity Distribution and Supply for the PSP which are as described below:

- **Volume 1** – Required as part of all other Volumes describes the Tariff Philosophy and Tariff Approval process, including the legal basis and minimum filing requirements underlying the rate setting guidelines for Electricity Distribution and Supply.
- **Volume 2** - Complementary to Volume 1 sets out the methodology including the formulae and principles for the determination of revenue requirements for Electricity Distribution Network System Operator (EDNSO) by PURC.

These two Volumes were approved by the Commission in August, 2017 to be incorporated as part of the Request for Proposals (RfP) for the PSP.

### **Net Metering Rates**

The Commission developed Net Metering Rates for the purchase of excess customer-generated energy by electricity distribution utilities. The rate reflects energy exchange between a customer/generator and the distribution utility in kilowatt-hours (kWh). The approved net metering rates were published on September 30, 2016 in Gazette No. 118/2016 as included in *Appendix I* to this report.

## **PERFORMANCE REGULATION ELECTRICITY**

### **Reliability and Regulatory Compliance Monitoring in the Western Region**

The Commission conducted monitoring in the Western Region during 2016, covering generation, transmission and distribution aspects of electricity. The thermal plants at the Aboadze Power Enclave, specifically the VRA, AMERI and TICO plants, GRIDCo installations, ECG installations as well as operations of ECG district offices in the region were monitored during the exercise. As part of the monitoring, PURC inspected progress in implementation of the transmission substation reliability and enhancement project. The new ECG prepayment metering systems were also reviewed. The monitoring took into consideration customer complaints received by the Commission from the region, which were ultimately satisfactorily resolved.

#### **Generation**

Reliability and Regulatory Compliance at the VRA Thermal Plant at Aboadze and TICO Thermal Plants were assessed in line with PURC's benchmarks. Based on the assessment, the Commission was satisfied that both the VRA Plant (TAPCO) and the TICO Thermal Plant had the required policies, procedures and systems to meet key regulatory benchmarks and were therefore rated compliant. The Commission however issued recommendations to the utilities to improve the strength of internal controls. The benchmarks for the Commission's compliance assessment can be found in *Appendix II* to this report.

#### **Transmission**

One of the Commission's objectives in the Western region monitoring exercise in 2016 was to inspect the System Reliability and Enhancement Project (SREP) being undertaken by GRIDCo in the Takoradi area. The project involved installation of 66MVA power transformer and construction of a new control room to facilitate effective power transmission and relieve load on existing transmission equipment.



**Figure 1: 66MVA Transformer, part of the SREP Project**



**Figure 2: New Control Room, part of the SREP Project**

Based on the Commission's assessment, the Takoradi area office of GRIDCo complied with the Commission's key reliability and regulatory compliance indicators and benchmarks as per readings taken from the energy meters installed at the substations and records inspected. The policies, procedures and systems in place were adequate and in compliance with regulatory benchmarks.

## Distribution

The Commission's assessment revealed that ECG compliance in the Western Region was generally above average with respect to key reliability and regulatory compliance indicators and benchmarks. ECG's policies, procedures and systems in the region were average. This indicated that ECG needed to work harder to improve the strength of internal controls in order to maintain full compliance with the Commission's indicators and benchmarks.

**Table 3: Compliance Status of ECG in the Western Region**

Reliability Index	Compliance Status						
	5	4	3	2	1	N/A	N/R
Compliance with Quality of Service Benchmarks			✓				
New Service Connection Procedures & Applications		✓					
Effectiveness of Complaint Handling Procedures			✓				
Technical Data Record Keeping			✓				
Maintenance		✓					
Overhead Conductors	✓						

\* N/A implies "Not Applicable"

\*\* N/R implies "Not Rated"

### Reliability and Regulatory Compliance Monitoring in the Northern Region

#### Transmission

The Commission in 2016 also monitored the operations of GRIDCo in the Tamale area in the Northern Region. The Tamale Substation is a main and transfer bus substation and comprises two 33MVA transformers. Other substations in the area include Buipe Substation, Yendi Substation and Bolgatanga Substation. At the time of the Commission's visit, GRIDCo was undertaking a number of System Reliability Enhancement Projects (SREP) in the Northern Region which included the replacement of the 12/13.3MVA transformer at Yendi to a 25/33MVA transformer; and the construction and commission of the Tumu-Bolgatanga line.

Based on physical inspection of the substation and interactions with officers of GRIDCo, the Tamale Area Office of the utility was found to be reasonably compliant with the Commission's key reliability and regulatory compliance indicators. However the Commission was unable to access GRIDCo Technical Data during the exercise thus lowering the region's compliance rating.

**Table 4: Compliance Level of GRIDCo in the Northern Region**

Reliability Index	Compliance Status						
	5	4	3	2	1	N/A	N/R
Compliance with Quality of Service Benchmarks							✓
Technical Data Record Keeping							✓
Maintenance					✓		
Overhead Conductor Termination			✓				

\*N/R was because Technical Data could not be accessed during the exercise

### Distribution- NEDCo

Compliance monitoring was conducted on power distribution and transmission installations in the Northern Region. The Commission visited NEDCo and GRIDCo stations within the region to ascertain reliability of power supply and compliance with operating benchmarks. At each station, the team inspected amongst other documentation, fault records, maintenance schedules and new service connection records. The stations visited included Tamale, Yendi, Bimbiila, Damongo, Buipe, Salaga, Savelugu and Tolon/Nyankpala. Based on assessment carried out, NEDCo was scored as average with respect to its compliance level in line with PURC's key reliability and regulatory compliance indicators and benchmarks. This score implied that NEDCo requires some material improvements to strengthen its internal controls in order to maintain compliance in the Region.

**Table 5: Compliance Level of NEDCo**

Reliability Index	Compliance Status						
	5	4	3	2	1	N/A	N/R
Compliance with Quality of Service Benchmarks			✓				
New Service Connection Procedures & Applications			✓				
Effectiveness of Complaint Handling Procedures							✓
Technical Data Record Keeping			✓				
Maintenance			✓				
Overhead Conductors				✓			

\*N/R : NEDCo did not have records of complaint resolution at the time of the Commission's exercise.

### Reliability and Regulatory Performance Monitoring in the Eastern Region.

The Commission undertook Reliability and Regulatory Compliance Monitoring of ECG in the Eastern Region. This activity was carried out within the distribution system in the year 2017 and the following were the major findings:

**Table 6: Compliance Level of ECG**

Reliability Index	Compliance Status

	5	4	3	2	1	N/A	N/R
Compliance with quality of service benchmarks			√				
New service connection procedures and applications			√				
Effectiveness of complaints handling procedures			√				
Technical data record keeping			√				
Maintenance			√				
Over Head Conductors			√				

Based on the Table 6 above, the Commission's assessment revealed that ECG compliance in the Eastern Region was generally average with respect to PURC's key reliability and regulatory compliance indicators and benchmarks. ECG's policies, procedures and systems in the region were average. This indicated that ECG needed to work harder to improve the strength of internal controls in order to maintain full compliance with the Commission's indicators and benchmarks.

### **Other Challenges Faced by ECG Operations in the Eastern Region**

1. The Eastern Region does not carry out meter audits periodically as required by Rules 6(d), 6(e), and 6(f) of Electricity Supply and Distribution (Technical and Operational) Rules, 2005 (LI 1816). The sections are quoted below:

#### **Rule 6—Metering**

A prospective customer must provide a suitable location at the premises for the installation of, and easy access to, the supplier's meter. The supplier shall

**Rule 6 (a)** provide, install and maintain a meter that will measure and record the amount of electricity supplied to the customer within specified accuracy limits of that meter's class;

**Rule 6 (d)** ensure that the accuracy of the meter is maintained throughout its usage and in accordance with the applicable metering code;

**Rule 6 (e)** test and if necessary calibrate industrial customers' meters periodically;

**Rule 6 (f)** carry out meter revision of its distribution system for meters that have been in service for twenty years or more;

2. ECG's technical staff failed to consistently verify the values from commissioning tests carried out by certified Energy Commission electrical wiring professionals. The Commission found that several of the values provided for earthing resistances for the earthing electrodes were beyond acceptable limits for safety.

3. ECG district offices visited had no proper fire safety signage for their staff or customers. For instance, none of the districts visited had a designated assembly point in case of an emergency.
4. Meter audits are not being carried out in the districts.
5. ECG has inadequate staff at the various stations visited. Some stations with over 12,000 customers have only 4 personnel to address commercial, metering, fault and new service connection needs of consumers, among others.
6. ECG does not have adequate instruments such as earth electrode resistance tester for testing customer installations prior to connecting onto the grid and rely mostly on visual inspections.
7. Problems with vegetation control and vegetation overgrowth due to inadequate bush clearing in the Tafo District among others.
8. Rampant linking of fuses with wires of unknown rating leading to burning of transformers and other faults in all districts visited.
9. Inadequate analysis of LV network faults to identify the root causes of faults and required remedies.
10. For instance, the Asamankese township had significant low voltage. The Commission will continue to monitor work on a new booster station project to improve voltages in the area which was about 95% completed at the time of inspection by the Commission.
11. Inadequate Personal Protective Equipment and safety tools (eg. Insulated gloves, operating rod) across the ECG districts visited.
12. Inadequate supply of meters to meet customer demand for new service connection.
13. A large number of faults and outages registered on ECG's network were due to broken poles, burnt poles and interruptions due to blowing of fuses.

### **Commission's Follow-up Action**

Subsequent to the monitoring exercise, the Commission pursuant to Section 12 of the PURC Act, 1997(Act 538) directed ECG to provide an undertaking on specific measures with timelines being implemented to address the above findings. The Commission will revisit the issues in subsequent monitoring exercises for appropriate action.

## **Investigation into Partial System Collapse**

The Network Interconnected Transmission System (NITS) suffered a partial system collapse on the 21st and 25th of January, 2016. The Commission investigated the incident and made the following findings.

### **Cause of System Collapse on January 21, 2016**

The system collapse was caused by loss of the 330kV Aboadze-Volta line. This was due to defective glass insulators on the 330kV Aboadze-Volta line. These insulators have been observed as cause of the system collapse experienced in the country. As a result of increased dust from the Harmattan (dry) season that particular year, the defective insulators failed, creating transient faults and surges which resulted in breaker isolation of the Aboadze – Volta line.

By this isolation, which had been preceded by tripping of the Aboadze - Cape Coast 161kV line, supply from the generating power plants located in Aboadze was cut off from reaching the eastern side of the country which bears the larger amount of load in the country. The Aboadze – Cape Coast line was undergoing troubleshooting and was out of circuit at the time of failure of the Aboadze – Volta 330kV line.

The isolation therefore resulted in frequency swings precipitating widespread tripping of transmission lines by distance relays. This was followed by the various thermal plants, namely Sunon Asogli, KARPOWER, CENIT, TT2PP tripping to shut down. Subsequently, with the three Akosombo units not being able to support the load, they also tripped. The collapse did not however affect the entire country. Customers in the Western Region were not affected by the collapse as the thermal plants and the lines serving these areas were still in service. This is attributed to the fact that the gas turbines appropriately deloaded thereby containing the remaining load within the isolated network. However high frequencies were experienced. These were still within the frequency band of the GTs thus allowing them to continue operating.

### **Cause of System Collapse on January 25, 2016**

The system collapse which occurred on January 25, 2016 was similar to that of January 21, 2016, being triggered by loss of transmission from the Aboadze enclave generators to the eastern part of the country where much of the national load is located including Accra with demand of about 700MW. A transient fault on the Takoradi to Cape Cost line had caused the line to trip. Prior to this the 330kV Aboadze–Volta line had tripped at about 06.12Hrs due to a suspected flashover. The line was therefore out of circuit for maintenance when the Takoradi-Cape Coast line tripped. This resulted in other lines supplying the eastern

part of the country from Aboadze to also trip. These trips caused sudden surges in the system resulting in the partial system collapse.

## Analysis of Network Data

### Generation Mix

In 2016, 43.9% of generation was obtained from hydro sources whilst 56.1% was obtained from thermal sources. This was in sharp contrast to a projected generation figure of 32.1% from hydro sources and 67.9% from thermal sources. Thus there was an over recovery of revenue in terms of hydro-thermal mix.

Thermal generation in the energy mix for 2017, increased from 44% in the first quarter to 59% in the second quarter. As at the close of the year 2017, the generation mix was 60% to 40% in favour of thermal generation. This is shown in Figure 3 below:

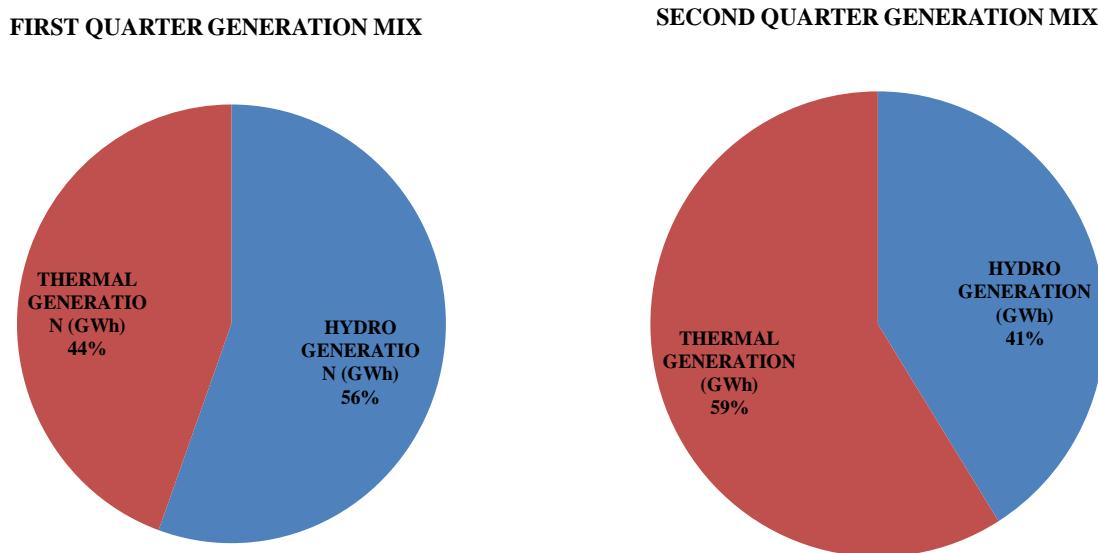
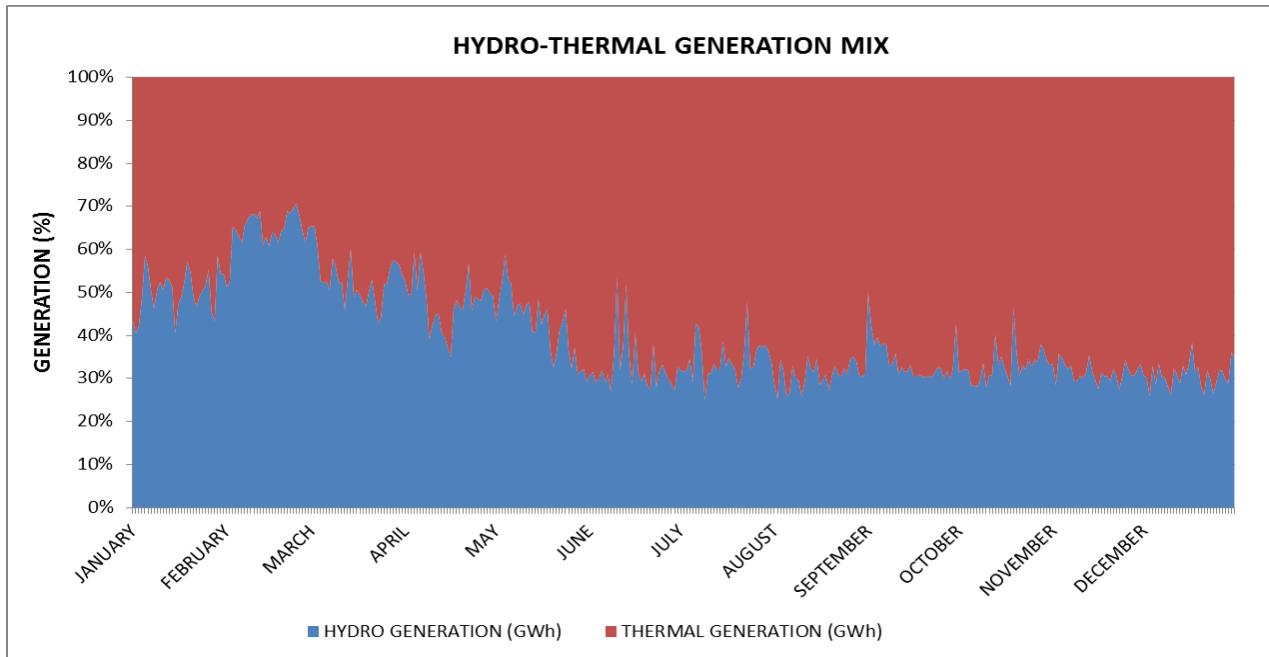


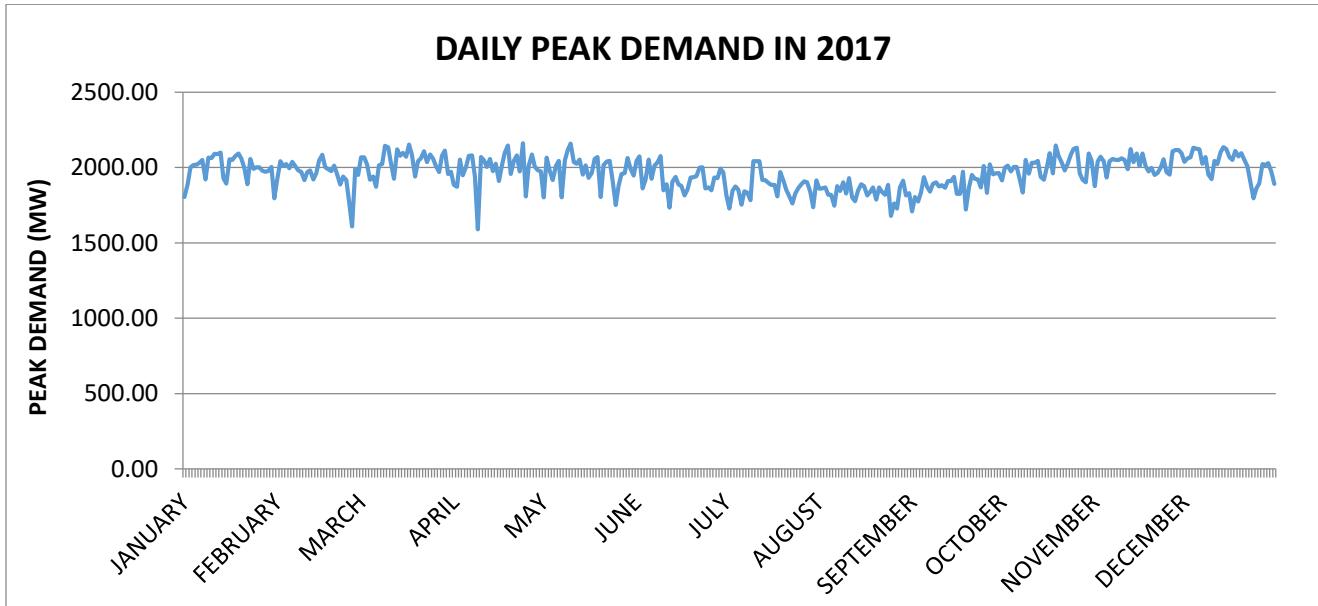
Figure 3: Generation Mix for 1st and 2nd Quarter of 2017



**Figure 4: Generation Mix for the Year 2017**

### Peak Demand

The average peak demand in the year, 2017 was about 1,963 MW. The highest and lowest demands recorded were about 2,161 MW and 1,590 MW respectively. This is shown in Figure 5 below.



**Figure 5: Daily Peak Demand in 2017**

## Dam Water Levels

The two major dams in the country, the Akosombo and Bui dams had a consistent decline in their headwater levels from the beginning of 2017 until July when they started to increase. In spite of the consistent decline, water levels of both dams have remained above their respective minimum levels of 240ft and 168ft respectively as revealed in Figure 6 and Figure 7.

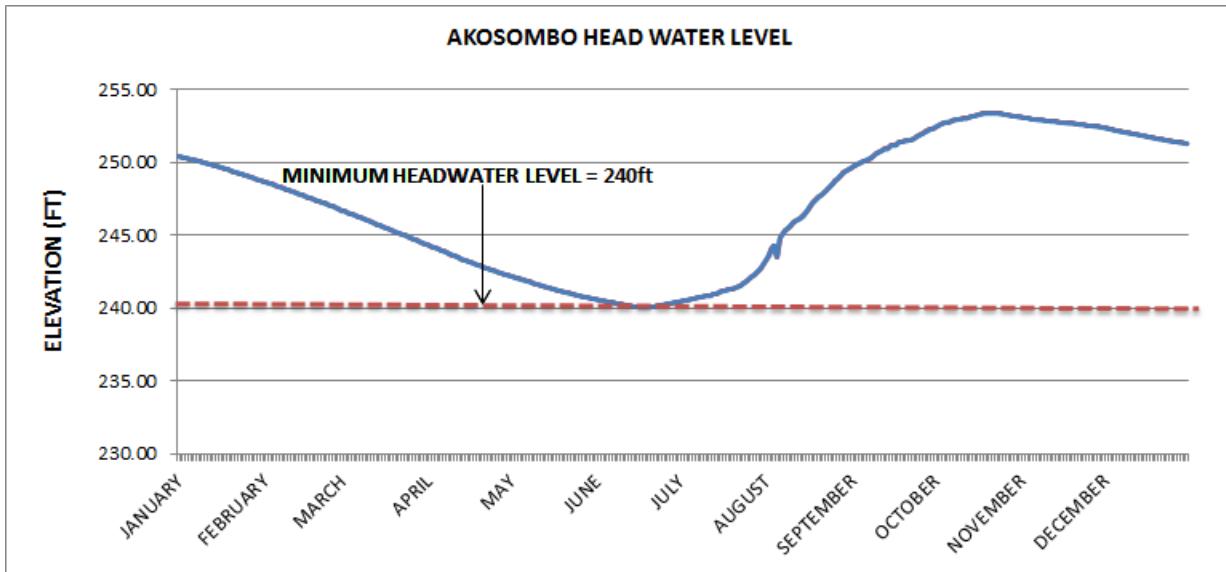


Figure 6: Akosombo Dam Head Water Level for 2017

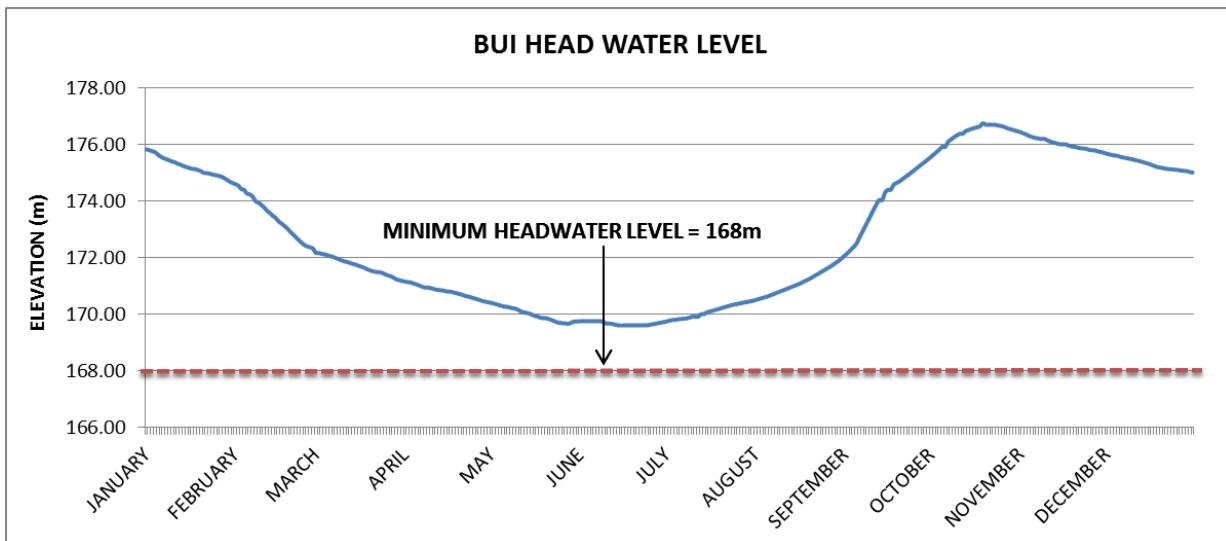


Figure 7: Bui Dam Head Water Level in 2017

## Transmission System Studies

### Volta-Achimota Transmission Lines Outage Impact Study

The above study was carried out by the Commission upon the request of the Ghana Grid Company (GRIDCo) to assess the impact of simultaneous outages of the Volta-Achimota transmission line on other lines and equipment in the National Interconnected Transmission System (NITS). This became necessary to enable the Ghana Grid Company (GRIDCo) to upgrade the Volta-Achimota transmission lines so as to accommodate the increasing power demand in Accra and its environs.

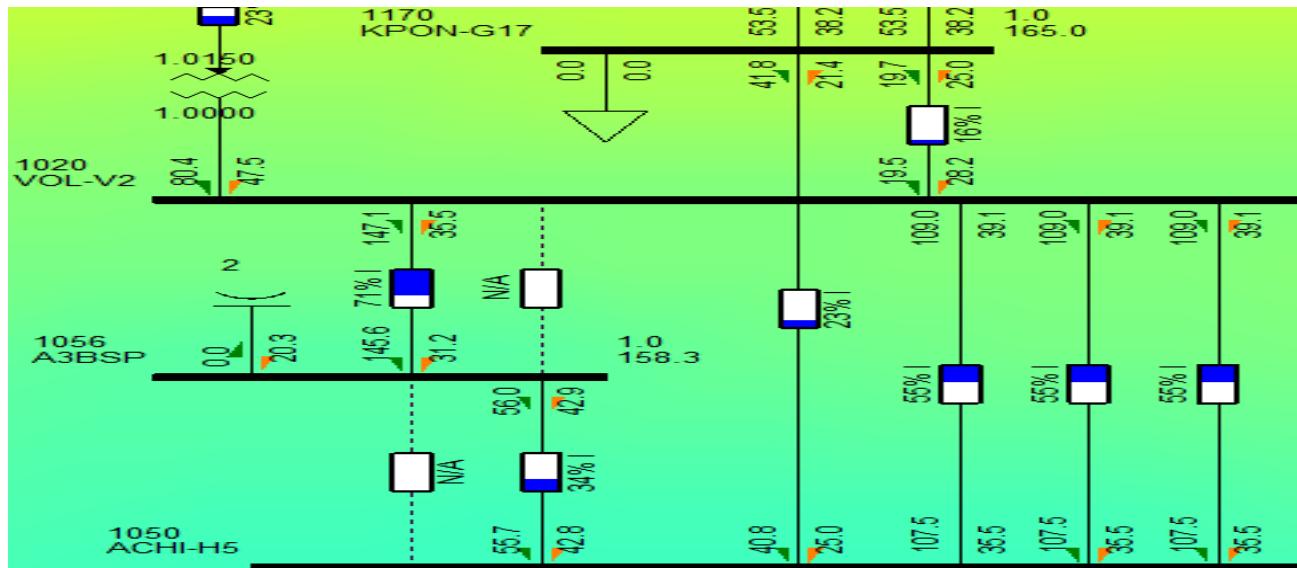
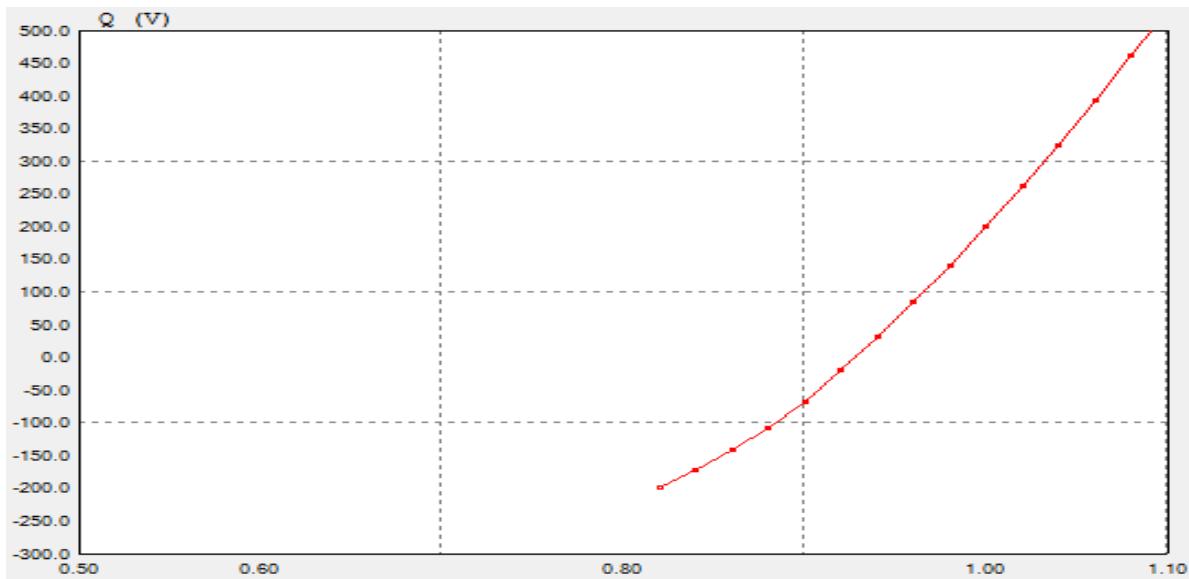
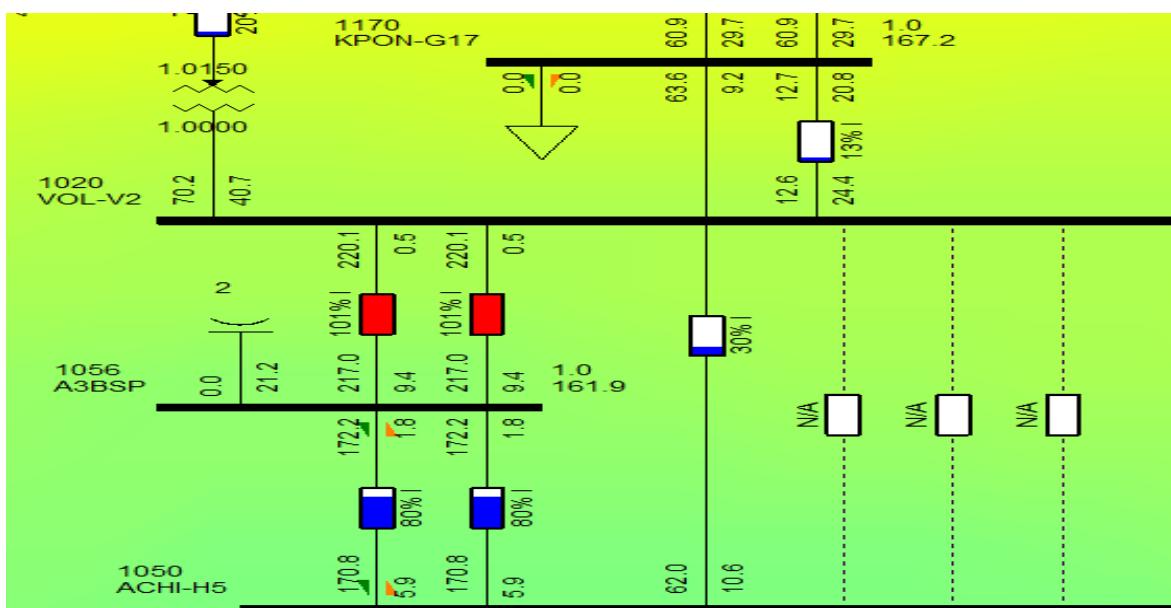


Figure 8: Loading of Transmission Lines between Volta and Achimota Substations Prior to Outages

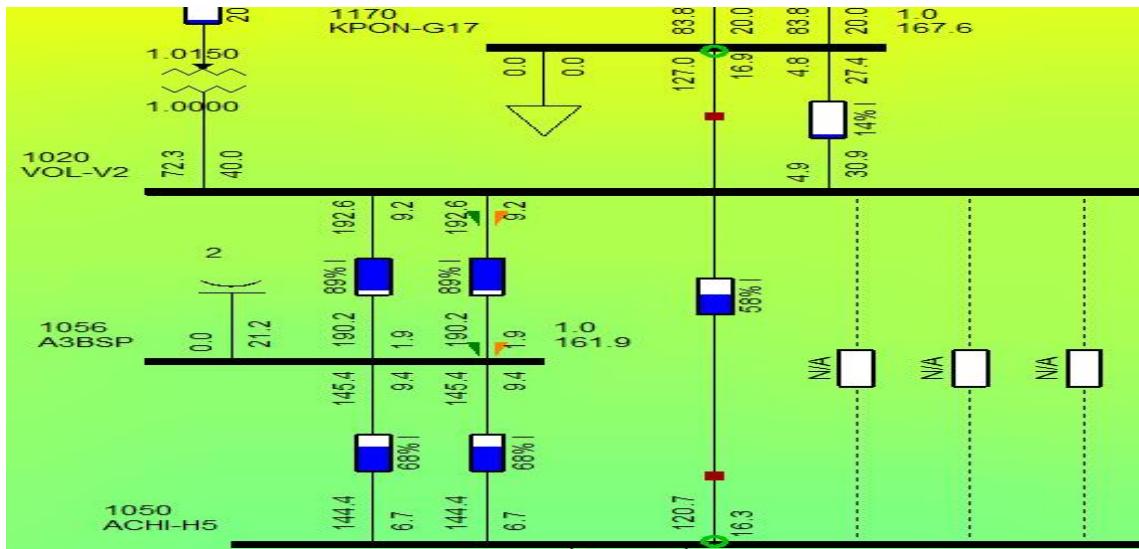
To improve the voltage profile at downstream buses due to outages on the Volta-Achimota Transmission Lines, a study carried out on the Mallam bus revealed reactive power injection requirement of about 200MVAR in order to improve the voltage on Mallam bus to 1.0pu as shown in Figure 8.



**Figure 9: Reactive power requirement at Mallam substation following outage of the Volta-Achimota Transmission Lines**



**Figure 10: Overloads due to outages of Volta-Achimota Transmission Lines**



**Figure 11: 70% Degree of Series Capacitor Compensation on Kpong-Achimota Line**

**Table 7: Summary of Findings during Commission's Study**

Number of Volta-Achimota Lines on Outage	Impact	Mitigation Measure	Remarks
One (1)	1. Volta-A3BSP overloaded (88%)	None	Overloading is marginal but can be avoided if series compensation is installed on Kpong-Achimota Line
Two (2)	1. Volta-A3BSP overloaded (119%) 2. Remaining One Volta-Achimota Line is overloaded (103%)	Construction of Volta-A3BSP-Achimota Line	Mitigation measure is expected to remove all overloads
Three (3)	1. Volta-A3BSP overloaded (203%) 2. Volta-Achimota Line is overloaded (163%)	Concurrent construction of Volta-A3BSP-Achimota Line and installation of series capacitor compensation (70% degree of compensation) on Kpong-Achimota Line	The mitigation measure is expected to remove all overloads with marginal loading on the Volta-A3BSP Line (89%).

The study determined that, it is possible to carry out simultaneous outages on the Volta-Achimota transmission lines but steps must be taken to reinforce portions of the network in order to accommodate the impact of the outages as below:

1. 200MVAR reactive power compensation at Mallam following simultaneous outages of two or three Volta-Achimota transmission lines.
2. Construction of new parallel Volta-A3BSP-Achimota line or upgrade of the capacity of the existing Volta-A3BSP-Achimota line (with high power transfer capability) to accommodate simultaneous outages of two or three Volta-Achimota transmission lines.
3. Incorporating some degree of series capacitor compensation on the Kpong–Achimota line will help address the low power transfer capability of the line and thus lower the overloads on the Volta-A3BSP-Achimota lines. Series capacitor compensation is quite cheaper than building a new transmission line but enough protection is advised to address its associated Sub-Synchronous Interactions (SSI).

### **Operational Performance and Fuel Audit Study**

The Commission constituted a committee of experts to conduct an operational performance and fuel audit of the thermal plants of the VRA and Independent Power Producers. In particular, the Committee was to examine more precisely the utilities' methodology for computation of fuel costs being passed on to consumers as a tariff pass-through item. The Committee was also tasked to assess the performance of GRIDCo with regards to dispatch operations.

The main objective of the study was to carry out a baseline evaluation for determining operational improvements and efficiency gains that could be achieved through performance improvement programmes and repair and maintenance plans.

The Commission's focus was to obtain recommendations for performance improvements that would reduce energy costs without affecting productivity and growth. The key recommendations from the study include the following:

- a) The thermal generating units should be operated within the recommended ranges listed in the baseline performance parameters which ensures that GENCO's technical and commercial operations are in line with international best practices.

- b) It was observed that all the IPPs and VRA were not routinely doing water injection even for NO<sub>x</sub> control. Controlled water injection should be done for power augmentation as recommended by unit manufacturers although it is primarily done for emissions (NO<sub>x</sub> –Nitrogen Oxides) control.
- c) Mandatory inspection of the units should be conducted per Original Equipment Manufacturer (OEM) recommendation.
- d) Performance tests (Combustion Inspection; Hot Gas Performance Inspection; Major Inspection) should be carried out on the units after every mandatory inspection preferably by an independent party in accordance with best practice.
- e) Carry out routine inter-schedule crawl-through inspection.
- f) GENCOs should be mindful of the commercial and financial implications of their operational decisions such as:
  - Operating generating units on part load;
  - Not adhering strictly to OEM recommended inspection and maintenance schedules, including inter-schedule crawl-through inspection.
  - Unavailability of critical maintenance spares.
  - Improper accounting for fuel delivered and consumed.

The Commission's key directives to the utilities were:

- a) To ensure accurate fuel accounting, standard fuel measuring totalizer meters must be installed to measure the following:
  - Fuel from raw fuel storage tanks to fuel oil treatment plants.
  - Re-circulated fuel from fuel oil treatment plant to the raw fuel storage tanks.
  - Treated fuel leaving the fuel oil treatment plants to the treated fuel storage tanks.This will enable proper tracking and determination of actual fuel consumed and fuel treatment losses.
- b) Control systems must be put in place to prevent spillage from raw and treated fuel tanks during filling.
- c) Installation of gauges on fuel storage tanks to determine the accurate volumes of fuel in the tanks.
- d) Recalibration of fuel storage tanks when certificates of calibration expire. Calibration certificates for the fuel storage tanks at Aboadze at the time of the study had all expired.
- e) The actual fuel loss factor (FLF) has to be determined and used in fuel accounting rather than assumption of 1% used within the VRA plant.

## **WATER**

### **Pro Poor Water Projects**

During the period under review the Commission validated works executed under PURC-GWCL Pro-Poor Water Projects awarded in previous years. The projects comprised a total of 22 boreholes in the Sissala West in the Upper West Region and Effiduase in the Ashanti Region. The projects were paid for with earmarked funding from the regulatory levy established under the Public Utilities Regulatory Commission (Amendment) Act, 2010 (Act 800).

By the end of 2016-2017, 48 additional proposals had been submitted to the Commission for new poor water projects. These proposals are being processed for implementation subject to due approval from the Public Procurement Authority. At the end of 2017 the Commission published a comprehensive Pro-poor Water Project Manual to aid the management of the project.

### **Verification of Completed Pro Poor Water Projects**

#### *Sissala West, Upper West Region*

Within the period under review, the Commission undertook verification of seven (7) mechanized boreholes constructed in seven communities in the Sissala West District of the Upper West Region by Messr Dowin Limited under the 2012 PURC Pro Poor Water Projects after the Commission had received the Interim Certificate No. 2 for payment to be made on behalf of the contractor. The completed projects were undertaken in Sibelle, Jitong, Nyamiti, Bullu, Buo, Liero and Gaapare. The Commission duly confirmed the completion of the project in all the seven communities where the mechanized boreholes were cited. The boreholes were fitted with 10,000 litre capacity polytanks mounted on elevated concrete platforms. Water from the boreholes is drawn into the overhead tanks via 1.0 hp submersible pumps. Each system was designed to deliver water from a total of 6 taps. Prepaid electricity metering units were provided in 6 out of the 7 communities. All the systems inspected were deemed functional at the time of the Commission's verification exercise. As a way forward, findings of the verification exercise provides an opportunity for the incorporation of lighting systems (streetlights) into future mechanized boreholes systems under the Commission's pro-poor projects. This will enable the utilization of the project even in non-daytime hours.

### *Verification of Completed Project in New Edubiase*

During the period under review, the Commission undertook verification of completed projects in New Edubiase in the Ashanti Region after the PURC had received Interim Certificate No. 3 submitted for payment to be made for a total of 15 boreholes constructed in some communities along the River Pra by Messr Benjeks Limited under the 2012 and 2013 PURC Pro Poor Water Projects. The project comprised the drilling and installation of hand pumps on boreholes in communities namely; New Edubiase Municipal Hospital, Habitat, Ahenakwa, Yaw Tawiah, Abease, Atobese, Nkramokrom, Sonkruyuwa, Lamleytse, Musakrom, Wureyei, Aminaso, Adansi Praso and Adansi Dove. During the verification exercise, the Commission ascertained the functionality of the water systems in thirteen of the fifteen beneficiary communities. All borehole systems were operational except for those in Sunkroyuwa and Adansi Praso which had developed faults and were undergoing repairs by the Municipal Assembly. It was noted that systems in some communities were characterized by frequent low yields especially during the dry seasons. The Commission will explore the possibility of incorporating the provision of bulk overhead tanks into future projects design.



**Figure 12: Water Provision in New Edubiase through PURC's Pro Poor Water Intervention**

### **Capital Projects**

In line with its strategy of monitoring utility capital investments, the Commission in 2016 – 2017 inspected some GWCL ongoing water projects in the Ashanti and Eastern Regions. The projects were undertaken at the Kwahu Ridge, Konongo and Kumawu.

### **Kumawu**

The project scope at Kumawu included:

- Weir and intake structure on the Afram River to impound 200,000m<sup>3</sup> of water
- 3 million gallon/per day water treatment plant to serve a target population of 160,000
- 71 km water transmission mains
- 31 km distribution network
- 3 no. ground level tanks
- 6 no. elevated water tanks
- Booster pumping station and district office
- 14 no. residential units
- 30 no. standpipes

*Percentage completion at the time of inspection = 87%*

### **Konongo**

The project scope at Konongo included:

- Rehabilitation and expansion of the existing intake structure on the Anum River
- 4.2mgd water treatment plant
- 1,000,000 m<sup>3</sup> off-river reservoir to store water during the wet season
- 8.5 km transmission mains from WTP to Konongo EWT
- Replacement of approximately 6km of AC pipes with HDPE
- 10km pipeline to Wioso
- 5km extension of the existing distribution network
- Rehabilitation of the district office and staff bungalows
- Rehabilitation of EWT (Agogo and Patriensa)
- New EWT (Juansa and Wioso)
- 10 no. standpipes
- Booster pumping station

*Percentage completion at the time of inspection = 94%*

### **Kwahu Ridge**

The project scope included:

- New intake structure (floating pontoon) on the Volta Lake
- Rehabilitation of the existing water treatment plant (approximately 1mgd)
- 2.3 km raw water line
- 9km transmission mains from WTP to Kwahu Tafo
- Rehabilitation of the Kwahu Tafo, Mpraeseo and Nkwatia Booster Stations
- Rehabilitation of staff bungalows
- 5 km extension of the existing distribution network

*Percentage Completion = 100%*

### **Audit and Inspection of GWCL Treatment Plants**

During the years under review, Commission undertook audit and inspections of some of GWCL treatment plants in the Western and Eastern Regions of the country. The audits looked critically at all treatment processes and units as well as electro-mechanical equipment. Emphasis was also placed on safety and raw water quality.

The audits and inspections revealed a grave threat to raw water quality at key GWCL treatment plants attributable to the following:

1. Illegal mining activities on the water sources that serve as raw water for the treatment plants;
2. Encroachment of settlements and farming activities on the buffer zones of the water sources;
3. Discharge of untreated effluents into the water sources;
4. Sand winning close to storage reservoirs; and
5. Nutrient loading of water bodies as a result of aquaculture close to GWCL abstraction points.

The persistence of the treat to the quality of water at abstraction points makes the treatment of water for potable use increasingly difficult. Additionally, the cost of treatment continues to increase as result of high cost of water treatment chemicals. The table and figures below shows the extent of impact of some activities on water bodies highlighted in 2016 during the Commission's audit and inspection activities in the country:

**Table 8: Summary of Water Sources and GWCL Systems Adversely Affected**

<b>GWCL Facility</b>	<b>Source</b>	<b>Location</b>	<b>Type of Activity</b>
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Kpeve Intake	Volta Lake	Volta Region	Fish farming
Odaso Intake	River Oda	Ashanti Region	Mining Activities
Konongo Intake	Anum River	Ashanti Region	Mining Activities
Anyinam Intake	Birim River	Eastern Region	Mining Activities
Nsawam Intake	Densu River	Eastern Region	Farming Activities
Winneba Intake	Ayensu River	Central Region	Sand Winning
Sekyere Hemang Intake	Pra River	Central Region	Mining Activities
Tanaso Intake	River Tano	BrongAhafo	Effluent Discharge
Vea Intake Point	Vea Dam	Upper East Region	Sand Winning



**Figure 13: Heavy Siltation at GWCL Abstraction Point at Nsawam**



**Figure 14: Small-scale Mining close to the GWCL Intake Point at Sekyere Hemang Headworks**

In the light of this, the Commission initiated collaboration with GWCL and other stakeholders including the Water Resources Commission (WRC) and the Environmental Protection Agency (EPA) to step-up efforts at safeguarding these water bodies. The intervention of the Inter-Ministerial Taskforce Against Illegal Mining also yielded some results which has seen to the resumption of treatment and supply of water to some affected communities such as Bonsu and Kibi in the Eastern Region in 2017.

Improvements in the characteristics of raw water abstracted from waterbodies situated in affected areas for treatment will be monitored subsequently to ascertain the impact of remediation efforts on the operations of the plants.

### **Drinking Water Quality Monitoring**

#### **Water Quality Monitoring in Communities Supplied by Befesa Desalination Plant**

The Commission continued its routine monthly sampling of water at areas supplied by the Befesa Desalination Plant at Teshie, Accra, to ascertain the quality of water distributed to those communities. The sampling and testing was carried out on areas within Teshie and Nungua, while other sampling points within the Accra East Region not served by the desalination plant were also analysed to provide a basis for comparison.

Test results indicated that the physico-chemical parameters of water samples from both the Teshie/Nungua and other areas complied with the national standards for drinking water, **GS 175-1** issued by the Ghana

Standards Authority in line with WHO Guidelines. All tests were conducted at the Water Research Institute (WRI) of the Centre for Scientific and Industrial Research (CSRI).

### **Investigations into Claims of Cyanotoxins in Drinking Water**

The Commission played a key role in a task force constituted by the Minister for Water Resources, Works & Housing (MWRWH) to establish the veracity of a newspaper publication of May 16, 2016 to the effect that pipe-borne water from Kpong and Weija Water Treatment Systems contained cyanotoxins. The Commission played an essential role in the investigation and a report was submitted to the Ministry in December, 2016.

The taskforce concluded that although Weija, Owabi Barekese and Kpong have recorded appreciable levels of cyanobacteria and its toxins in the raw water, current treatment methods used in these treatment systems have generally proved to be effective in removing cyanotoxins in the final drinking water. However, it is possible that with incessant nutrient loading of the raw water, the threshold of cyanotoxins could one day exceed the current removal capacity of the existing treatment systems, thereby posing a significant risk to the public in future. Inappropriate settlement development in reservoir catchments, poor management of municipal wastes and agricultural practices as well as illegal fishing and mining ('galamsey') activities are the key drivers of nutrient loading of reservoirs. Excessive nutrient loading is responsible for algal blooms in the country's reservoirs, especially the Weija, Owabi and Barekese. The Commission expects that Government through the MWRWH to address this risk in a timely manner.

### **Water Testing Equipment**

In order to enhance its water testing operations, the Commission procured essential testing equipment including a spectrophotometer (Hach 3900), a pH/TDS meter, total suspended solids meter, portable incubator, standard solutions and reagents among others. These will enable the Commission conduct field tests and respond to consumer complaints with regards to water quality in a timely manner.

### **Field Investigations and Inspections**

The Commission also conducted investigations into water supply challenges affecting consumers during the period under review. Some of the investigations were occasioned by the Commission's analysis of supply situation reports and also complaints received from members of the general public about water supply in certain areas. The complaints were adequately resolved.

### **Investigations into Power Supply Issues at Dodowa Booster**

The Commission investigated power challenges faced by the Dodowa Booster Station of the Ghana Water Company Limited emanating from analysis of Daily Situation Reports received from the ATMA Control Room of GWCL.

### ***Findings and Observations***

#### **Power Supply Situation**

Power supply to the booster station is from Ghana Grid Company Limited (GRIDCo) but controlled at the China Gezhouba Plant located at Kpong. This arrangement implies that apart from outage problems that may be peculiar to the booster station itself, any power outage problem at Gezhouba also remotely affects the Dodowa Booster Station. This includes requests from GRIDCO to Gezhouba for shutdown for regular maintenance by GRIDCO. The distance between the Dodowa booster station and the China Gezhouba Water Treatment Plant spans about 70 kilometers yet the electricity meter for the booster station is located at the Headworks of the Gezhouba Plant at Kpong. The power lines connecting the two facilities which should have been dedicated to the sole use of the booster station also serve private housing infrastructure situated in communities located along the lines. The situation presents some difficulties to the GWCL in the attempt to monitor these power lines. Losses along these power lines may affect the reliability of supply to the Dodowa booster station.

#### **Operations**

The booster station has a current capacity of 40MGD, likely to increase with plans to add on an additional 40MGD under the second phase of the project. Supply from the booster station partly supplies communities along the Accra-Dodowa Highway such as Adenta, Madina, parts of Oyibi, Amrahia, etc. Water from the Dodowa Booster Station is also pumped to the Accra Booster Station in Okponglo, the Boi Booster Station as well as the Legon PRESEC Reservoir for further distribution within parts of the Accra-East Supply Region of the GWCL.

At the time of PURC's visit to the station, some buildings housing the electrical control panels at the station were experiencing leakages from the roof. The effect of the water from the leakage on the concrete walls was evident in dampness in the wall and defaced paint works on the structures. A leakage was noticed on one of the pumps. Attempts by staff of the station to rectify these have not been successful. The difficulty around the pump leakage stems from the fact that no isolating valves have been provided and all the pumps pump into a single header, a pipe sharing the flow into other pipes while operating at the same head. Therefore, should there be shutdown of all pumps in an attempt to remedy the situation a significant amount of water remains in the lines even after 24 hours. It was also noted that the other pump sets also run the risk of having the same leakage problem occurring.

Managers of the station mentioned inadequate inclusion of key recommendations from GWCL operational staff during the construction phase as a major bottle neck in the smooth operation of the station. Ineffective co-operation between the contractors with GWCL personnel during the Interface Period of the Phase One of the project was also cited as a major constraint. Stated below are other notable challenges affecting operations at the Booster Station;

- i. Colour codes of switches on panels in the control room machine were reversed. Green lights which should signify that units were operating rather indicated that the operations on the units were halted. Similarly, red lights indicated that operations on units were on.
- ii. Inscriptions for operating the panels were also written in Chinese language.
- iii. Stairs leading into location of the pumps are steep and dangerous.
- iv. The pumps have to be started by operating an actuator and then turning valves in quick succession. However, the actuator and valves have been placed at opposite sides of the pump and this requires an additional operator to successfully start the pumps.

### ***Recommendations***

1. GWCL should go into maintenance agreement (as discussed between GWCL and PURC) with GRIDCO that will ensure effective monitoring of the power lines between Gezhouba and Dodowa.
2. GWCL should urgently see to the issue of colour coding of the switches on the panels at the Booster Station. Operational instructions currently in Chinese Language must be translated into English immediately. This is non-negotiable for occupational health and safety practices within GWCL's operations.
3. Even though the booster station does not currently undertake disinfection of water leaving the station, GWCL should consider incorporating a Chlorine Dosing Unit into the Phase 2 of the Project at the station.
4. GWCL should take steps to resolve the roof leakages affecting the buildings as well as the leakage on the Highlift Pumps at the station and also make inputs into improving similar design in the Phase 2 of the project.

### **Investigations into Complaints of Water Supply Challenges in Anyaa in Gt. Accra Region**

Following complaint from parts of Anyaa under the North West II District of the Ghana Water Company Limited, PURC conducted preliminary investigation aimed at assessing the extent and impact of the interruptions in supply to the affected community. The investigation revealed that whilst some houses had

supply, others especially those situated on higher elevations had their supply interrupted. Generally, flow in the area was characterized by low pressure. There was indication from the District Manager for Accra North-West II that the installation of new pump sets at the Sowutoum Booster Station coupled with some power supply challenges at the booster station were responsible for the shortfall in supply.

The Commission recommended the issuance of leaflets or use of communication vans to disseminate information about the shortfall in supply to customers in the parts of Anyaa where interruption was likely to be prolonged.

## **CONSUMER SERVICE**

### **Community Monitoring**

During 2016-2017, the Commission run a number of community monitoring programmes across the country under the theme *Service Reliability* and *Customer Care*. These were targeted at consumers who could not access the Commission's Regional Offices in order to seek redress to their complaints. These activities afforded the Commission an opportunity to engage District Assemblies, opinion leaders and the district utility officials on the quality of utility service extended to consumers. In the course of these interactions, the Commission's staff resolved complaints and educated consumers on utility tariffs and computation of their bills, the processes for acquiring meters, new service connection charges as well as the process for lodging complaints with the Commission.

In addition to the receipt and resolution of complaints during the exercise, the Commission had focus group discussions with stakeholders to assess service provision in these areas.

### **Service Reliability**

Consumer complaints related to power outages resulting from phase-offs and low voltages in their communities. Customers also complained about the length of time taken by ECG in restoring supply. The distribution utilities in their response attributed such delays in responses to the distances that have to be covered between the communities and the District Offices.

### **Customer Care**

Customers mostly complained about poor customer service extended to them by staff of ECG. Customers intimated that complaints such as over-billing, bulk billing, and wrong meter reading among others which were lodged with the utilities took a long time to be addressed. Customers within NEDCo jurisdiction however expressed their satisfaction with the service provider.

### **Public Education**

PURC in its quest to sensitize utility consumers about the existence of the Commission undertook various educational activities in the country. The education platforms included radio, television talk shows, interviews and interactive educational programs with institutions of higher learning and the general public. Public Education which was aimed at taking the Commission closer to the general public was carried out in about sixty (60) communities in the Volta, Eastern, Western, Central and Brong Ahafo Regions. In addition to the education within the communities, some groups and trade associations such as the Ghana National Disabled Association in Kumasi, the Ghana National Tailors and Dress Makers Association

(GNTDA), Ghana Association of Beauticians (GABA) across the country were also reached through the Public Education Programme.



**Figure 15: Focus Group Discussions at Breko in the Western Region**



**Figure 16: Officers of the Commission Resolving Complaints of Customers in the Western Region**



**Figure 17: Public Education at Barekese and the Kwame Nkrumah University of Science and Technology (KNUST).**

### Consumer Complaints Management and Resolution

Resolution of complaints is a major aspect of the Commission's functions. In 2016-2017, the Commission received five thousand nine hundred and fifteen (5,915) consumer complaints against the regulated utilities. These came from various sources such as a PURC Complaints Clinic, written complaints addressed to the Commission, walk-ins, phone calls and others. 5,185 of the complaints were amicably resolved by the Commission representing 87.7% of the complaints received. The remaining 730 representing 12.3% due to their technical nature were at various stages of resolution as at the end of the reporting period. It must be stated that 625 complaints which were not resolved in 2016 were all resolved in 2017. Table 9 below shows the various complaints lodged and number resolved for the years 2016 and 2017.

**Table 9: Complaints Lodged & Resolved**

Quarter	Total Complaints		Complaints (ECG)		Complaints (VRA/NEDCo)		Complaints (GWCL)	
	Lodged	Resolved	Lodged	Resolved	Lodged	Resolved	Lodged	Resolved
<b>2016</b>	3,202	2,577	2,491	1,921	242	227	469	429
<b>2017</b>	2,713	2,608	2,167	2,073	138	134	408	401
<b>TOTAL</b>	<b>5,915</b>	<b>5,185</b>	<b>4,658</b>	<b>3,994</b>	<b>380</b>	<b>361</b>	<b>877</b>	<b>830</b>

Table 9 above shows statistics of complaints lodged with the Commission in 2016 and 2017 against all the regulated distribution utilities namely ECG, NEDCo and GWCL. The figures indicate that 78.8% of the complaints were lodged against the ECG, whilst 14.8% were against GWCL and with the remaining 6.4% against NEDCo. The Commission received 3202 representing 54.1% of the total complaints in 2016 as against Two Thousand Seven Hundred and Thirteen 2,713 representing 45.9% in 2017. The

Commission also resolved 2,577 representing 80.5% of the 2016 complaints whilst 2,608 or 96.1% in 2017 were resolved.

Table 10 below depicts the various classes of complaints which were brought before the Commission in 2016 and 2017. These include: complaint of damage to equipment, unlawful disconnections, non-reflection of payment of bills, quality of service issues, metering and billing.

**Table 10: Breakdown of Complaints Received - ECG/NEDCo/GWCL**

Quarter	Billing	Payments	Quality of Service	Metering	Unlawful Disconnection	Damaged Equipment	Total
<b>2016</b>	2,043	88	679	298	81	13	<b>3,202</b>
<b>2017</b>	1,614	101	698	197	100	3	<b>2,713</b>
<b>Total</b>	<b>3,657</b>	<b>189</b>	<b>1,377</b>	<b>495</b>	<b>181</b>	<b>16</b>	<b>5,915</b>

Utility consumers lodged various categories of complaints against their distribution companies. Billing was the topmost issue consumers complained of, constituting 61.8% of the total complaints received at the Commission. The reason for this could be attributed to the introduction of the ECG new billing system, termed Commercial Management System (CMS) which was accompanied by serious teething problems during its implementation stage.

Wrong bills issued to customers, untimely delivery of bills, as well as bulk billing of customers were among the most reported cases. In most cases, bulk bills issued to customers caused customers to be placed in higher tariff bands instead of lower tariff bands. The Commission ensured that the utilities resolved all these complaints.

#### **Billing Adjustments totalling GHS5,470,725.62 in favour of Customers**

Over the period under review, the Commission recovered an amount of Five Million, Four Hundred and Seventy Thousand, Seven Hundred and Twenty-Five Ghana Cedis, Sixty-Two Pesewas (**GHS5,470,725.62**) nationwide in favour of customers. This was as a result of investigations into wrong bills issued to consumers as well as other activities undertaken by the Commission. The regional breakdown of these corrections is stated in Table 11 below.

**Table 11: Adjustments in Favour of Customers through PURC Intervention**

<b>Region</b>	<b>Amount (GHS)</b>
Eastern	13,771.00
Western	594,522.75
Ashanti	403,656.97
Volta	61,302.82
Greater Accra	4,397,432.90
Northern	-
<b>Total</b>	<b>5,470,725.62</b>

The amounts in Table 11 were monetary sums accruing from billing anomalies (electricity and water) which were rectified in favour of customers with the intervention of the Commission.

### **Monitoring of Customer Service Provision**

#### **Customer Service Centres and District Offices of Regulated Utilities**

To enforce standards of performance at the Customer Service Centres (CSC) and District Offices of the regulated utilities, the PURC visited and monitored 58 CSCs and District Offices of the regulated utility companies in five regions i.e. Greater Accra, Ashanti, Central, Eastern, Volta and Brong Ahafo as indicated in Table 12 below:

**Table 12: Distribution of District Offices Monitored**

UTILITY	REGION	NO. VISITED	LOCATION
ECG	Tema	6	Afienna, Prampram, Tema North, South, Afienna and Nungua
	Eastern	7	New Abirem, Suhum, Kade, Akim Oda, Akim Tafo, Koforidua and Akwatisia
	Ashanti	5	New Edubiase, Offinso, Mampong, Abuakwa and Konongo
	Central	4	Assin-Fosu, Cape Coast, Saltpond and Twifo- Praso,
VRA/NEDCo	Volta	2	Hohoe and Denu
	Brong Ahafo	9	Techiman, Ejura, Yeji, Kintampo, Atebubu, Akomadan, Tepa, Kwame Danso and Hwidiem
	Tema	4	Batsoona, Gbetselle, Ashiaman East and Ashiaman West
	Eastern	7	Akim Oda, Kade, New Juaben, Amanokrom, Suhum, Krobo Odumase and Nsawam
GWCL	Ashanti	4	Offinso, Abuakwa, Kumasi West 1 and Kumasi West 2
	Central	4	Cape Coast North, Cape Coast South, Elimina and Saltpond
	Volta	5	Ho, Peki-Dayi, Denu, Keta and Sogakope
	Brong Ahafo	1	Techiman
<b>TOTAL</b>		<b>58</b>	

The District offices and Customer Service Centres were assessed on three regulatory benchmarks namely: ***Outlook; Customer Care and Efficiency.*** Though some improvements have been made in the outlook of most of the Centres, customer care and efficiency in service delivery remain a challenge to the utilities.

## **Observations at E.C.G and NEDCo District Offices and Customer Service Centres**

### ***Outlook***

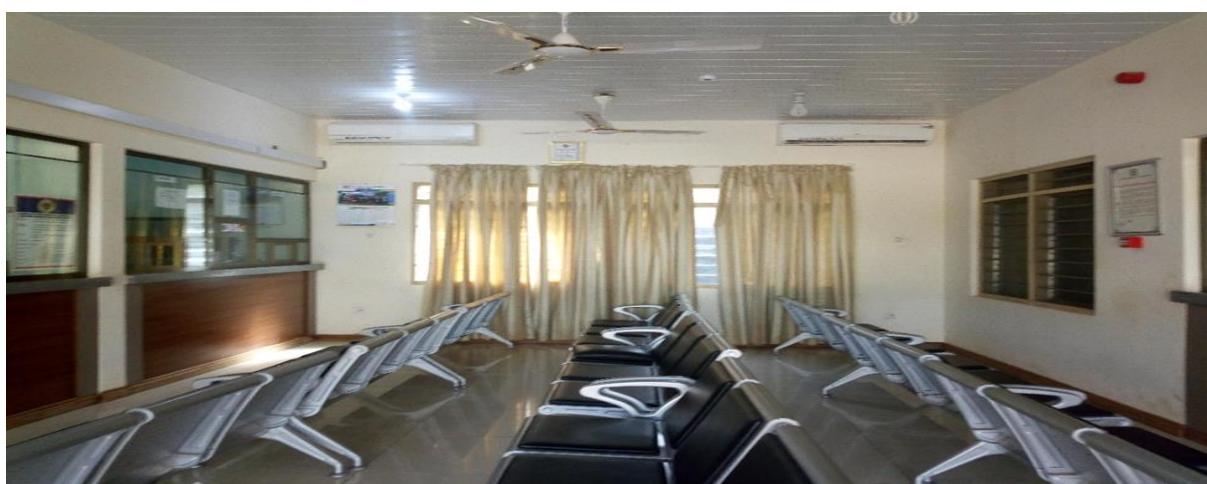
The Customer Service Centres (CSC) and District Offices visited were found to be strategically located, accessible, and convenient with appropriate signage, with the exception of Kade in the Eastern Region under the ECG and Tepa district office in the Brong Ahafo Region under NEDCo. However some NEDCo District Offices were congested owing to the relatively small size of office space. This resulted in their crowding with materials in the available work space.

### ***Customer Care***

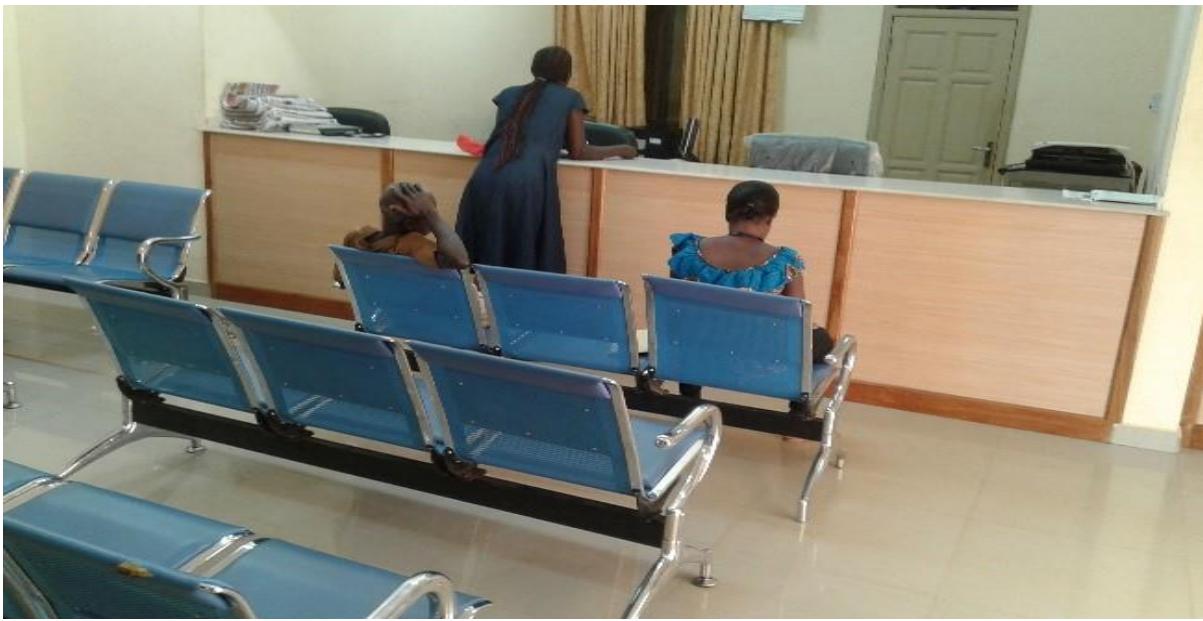
The Commission observed good customer care at the CSCs and District Offices during its monitoring activities in 2016 and 2017. Utility front line officials were found to be cordial at most of the District Offices visited. There were displays of the PURC Tariff Reckoner, other consumer educational materials and brochures at the various district offices of ECG.

However, the situation was different at District Offices of NEDCo as none of their offices had any educational materials on display; neither did they have good records on customers complaints. The Commission realized that public education which needed to be undertaken by the District Offices of ECG and NEDCo in their areas of jurisdiction was hardly done although some education took place on local FM radio stations in a few SHEP areas.

The Commission observed that all the District Offices of ECG and NEDCo visited within the period had a backlog of paid-up customers awaiting service connection. The backlog was attributed to non-availability of materials and energy meters. Most of customers in NEDCo areas had not been metered hence were on flat rates. The issue is being taken up by the Commission for redress.



**Figure 18: Newly Acquired Seats at the Dambai Office of ECG**



**Figure 19: ECG Office at New Abirim**

#### *Resource*

Staff at ECG District Offices visited were generally satisfied with facilities at their disposal to ensure efficient service, including vehicles, computers, cash machines, dedicated telephone lines, among others. The Commission found a gradual improvement in complaints management. Through the Commission's regulatory interventions, most utility customer centres now keep proper consumer complaint management records which mostly indicate timely resolution and fault management. From records accessed by the Commission during 2016 and 2017, almost all existing ECG customers under the District Offices visited were metered. The challenge was with provision of meters leading to delays in new service connection.

Revenue mobilization and collection ratio was encouraging at the CSCs visited in the period under review. The utility companies, particularly NEDCO, were encouraged to augment staff and logistics strength of the faults and maintenance team at almost all the CSCs visited.

#### **Workshops and Conferences**

The Commission participated in the second Renewable Energy Fair which was organized by Energy Commission under the theme "***Renewable Energy and Energy Efficiency: Accelerating Energy Access and Security***", which was held in Accra. In similar vein, the Commission was represented at the 20<sup>th</sup> Ghana International Trade Fair, which was organized in Tamale under the theme "***Two Decades of International Trade Fair in Ghana; Exploring Business Opportunities in the SADA zone of Ghana.***"

## **ENFORCEMENT**

During the period under review the Commission defended its mandate and decisions in a number of civil suits in the High Court and Court of Appeal. The cases raised some fundamental legal and regulatory issues including

1. Whether the exercise of powers under the Public Utilities Regulatory Commission Act, 1997 (Act 538) are discretionary within the meaning of Article 296 of the 1992 Constitution of Ghana.
2. Whether the electricity tariff increase of 2015 in the face of power outages was unfair, illegal or invalid.
3. The Commission's exclusive mandate to issue Rate Setting Guidelines for rates chargeable by electricity utilities.

At the end of 2017 the above cases were still pending in court.

## **Notifications**

Section 24 of Act 538 imposes a duty on public utilities to furnish the Commission with information including:

1. Financial and Operational Reports;
2. Contracts, Engineers Reports, Documents, Books, Accounts and other records relating to its property, service or business; and
3. Specific answers to questions submitted by the Commission.

Under Sections 11, 12 and 24 of Act 538, the Commission issued several Notifications and 6 Final Orders against utility companies. Notifications issued by the Commission were to direct ECG, NEDCo, GWCL, Karpowership and AMERI Power Plants to submit specific data to the Commission to aid the performance of regulatory functions. All Notifications were complied with by the utility companies, although timeliness of submission was an issue in some cases. Upon review of reasons adduced by the defaulting utilities the Commission decided to waive enforcement of penalties imposed.

The Commission is also statutorily mandated to direct the provision of adequate or reasonable service by a public utility. In furtherance of this mandate, Orders were issued to ECG, NEDCo and GWCL to:

1. Ensure the availability of facilities for purchase of units for prepayment meters
2. Rectify customer billing for electricity and water consumption following the December, 2015 Major Tariff Review
3. Suspend the roll-out of ECG's Customer Management System (CMS)
4. Re-connect or re-bill all customers wrongly disconnected or wrongly billed on the basis of the CMS

5. Engage the services of an independent billing software expert to audit the application of the CMS
6. Suspend a proposed new water billing system pending the demonstration of its effectiveness and efficiency to the Commission; and
7. Implement various public education plans approved by the Commission.

All but one of the Orders were satisfactorily complied with by the utilities concerned. In respect of the outstanding issue, an enforcement action was initiated by the Commission in the High Court for an order of the Court to compel the payment of penalties imposed by the Commission. The case was still pending in court at the end of 2017.

The Commission's position is that criminalization of non-compliance with Act 538 impedes regulatory efficiency. This is because enforcement becomes subject to the bottlenecks of the court system. Ultimately a better means of ensuring utility compliance with regulatory standards is to empower the Commission to impose administrative penalties. Proposals have been developed for the necessary legislative amendments.

The Commission also intends to streamline its current legislative instruments to enhance its legislative authority as far as monitoring and enforcement of performance benchmarks and efficiency framework is concerned. Work on this will be implemented in subsequent years.

The Commission, being the institution mandated to determine utility tariffs and monitor utility performance, is considered an Implementing Entity within the meaning of the Government of Ghana - US Compact II Agreement. Consequently, the Commission extensively engaged with the Millennium Development Authority and its Transaction Adviser the International Finance Corporation during 2016-2017. Areas of discussion included:

- Proposed Implementing Entity Agreement between MiDA and PURC
- Proposed IFC Tariff Methodology for Private Sector Participation in ECG (ECG-PSP)
- Procurement documentation related to identification of a concessionaire for ECG-PSP.

## **FINANCIAL STATEMENTS**

## **FINANCIALS FOR 2016 OPERATION**

### **Results of Operations**

Results of operations for the year ended December 31, 2016 are set out in the Income Statement, Statement of Financial Position, Statement of Cash flows and the notes to the Financial Statements as set out below. The Financial Statements represent fairly, in all material respects, the state of affairs of the Public Utilities Regulatory Commission as at December 31, 2016, and are in conformity with the International Public Sector Accounting Standards and the PURC Act, Act 538 of 1997 (as amended by PURC (Amendment Act), 2010 (Act 800).

Operations for the year resulted in an excess of income over expenditure of GH¢21,180,169 as against GH¢22,222,847 in 2015 indicating a decrease of approximately 4.7% of income over expenditure. Total Assets as at 31st December 2016 was GH¢210,961,910 as against the 2015 figure of GH¢127,741,692. This indicates an increase of 65% in total assets. The bulk of these assets are however in current assets and specifically in accounts receivables and prepayments, which constitute approximately 95% of total assets.

### **Statement of Commissioners' Responsibilities**

The PURC Act, Act 538 requires the Commission to maintain proper books of accounts and submit Audited Financial Statements at the end of the financial year to Parliament. In preparing the Financial Statements, the Commission applied appropriate accounting policies and complied with all appropriate Accounting Standards and with the relevant Statutes of Ghana. The Commissioners took steps that were reasonable to safe guard the assets of the Commission and to prevent and detect fraud including other irregularities. The accounts below give a comparative analysis of the Commission's position between 2015 and 2016.

STATEMENT OF COMPREHENSIVE INCOME  
FOR THE YEAR ENDED 31<sup>ST</sup> DECEMBER 2016

	<u>NOTE</u>	<u>2016</u>	<u>2015</u>
		<u>GH¢</u>	<u>GH¢</u>
<b>REVENUE</b>			
Regulatory Levies	3	41,159,655	37,717,896
Donor and Others	4	906,822	4,443,260
		-----	-----
<b>Total Revenue</b>		<b>42,066,477</b>	<b>42,161,156</b>
		=====	=====
<b>Expenditure</b>			
Personnel Cost	5	10,679,981	9,833,701
Commissioners' Allowances	6	617,400	522,550
Administrative Expenses	7	3,367,294	3,509,106
Operational Expenses	8	6,328,848	6,072,952
		-----	-----
<b>Total Expenditure</b>		<b>20,993,523</b>	<b>19,938,309</b>
		=====	=====
<b>Net Surplus/(Deficit) for the Year</b>		<b>21,072,954</b>	<b>22,222,847</b>
		=====	=====

ACCUMULATED FUND FOR THE YEAR ENDED 31 DECEMBER 2016

Balance as at 1 <sup>st</sup> January	24,999,407	2,776,560
Net (Deficit)/Surplus for the Year	21,072,954	22,222,847
<b>Balance at 31<sup>st</sup> December</b>	<b>46,072,361</b>	<b>24,999,407</b>
	=====	=====

STATEMENT OF FINANCIAL POSITION AS AT 31<sup>ST</sup> DECEMBER 2016

**ASSETS**

<b><u>Non-Current Assets</u></b>	<b><u>NOTE</u></b>	<b><u>2016</u></b>	<b><u>2015</u></b>
		<b><u>GH¢</u></b>	<b><u>GH¢</u></b>
Property, Plant And Equipment	9	5,810,427	6,338,353
Capital Work-In-Progress	10	3,986,321	3,984,321
Deferred Expenditure	11		919
Intangible Asset	12	111,661	179,586
		-----	-----
		<b><u>9,908,409</u></b>	<b><u>10,503,179</u></b>
		=====	=====
<b><u>Current Assets</u></b>			
Accounts Receivables and Prepayments	13	199,809,178	116,915,528
Cash and Bank Balances	14	1,244,323	322,985
		-----	-----
		201,053,501	117,238,513
		=====	=====
<b><u>TOTAL ASSETS</u></b>		<b><u>210,961,910</u></b>	<b><u>127,741,692</u></b>
		=====	=====
<b><u>EQUITY &amp; LIABILITIES</u></b>			
<b><u>Equity Attributable to Equity Holders</u></b>			
Accumulated Fund		46,072,362	24,999,407
Capital Surplus	15	4,495,651	4,495,651
		-----	-----
<b><u>Total Equity</u></b>		<b><u>50,568,013</u></b>	<b><u>29,495,058</u></b>
		=====	=====

### Current Liabilities

Accounts Payables & Accruals	16	160,393,897	98,246,634
<b>Total Current Liabilities</b>		<b>210,961,910</b>	<b>98,246,634</b>
		=====	=====
<b>TOTAL EQUITY AND LIABILITIES</b>		<b>210,961,910</b>	<b>127,741,692</b>
		=====	=====

CASHFLOW STATEMENT FOR THE YEAR ENDED  
31<sup>ST</sup> DECEMBER 2016

<b><u>OPERATING ACTIVITIES</u></b>	Notes	<b><u>2016</u></b> <b><u>GH¢</u></b>	<b><u>2015</u></b> <b><u>GH¢</u></b>
Net (Deficit)/Surplus for the year		21,072,954	22,222,847
<i>Adjustments for:</i>			
Amortization of Deferred Expenditure	11	33,500	
Computer Software Amortization	12	212,014	
Depreciation	9a	815,167	735,596
Profit/(Loss) on Disposal	9b	(28,514)	
		-----	-----
<b>Operating Profit before Working Capital Changes</b>		<b>21,888,121</b>	<b>23,175,443</b>
Changes in Trade Receivables& Prepayments	13	(82,868,524)	(83,688,709)
Changes in Trade Payables	16	62,122,139	61,216,754
		-----	-----
<b>Net Cash from/(used in) Operating Activities</b>		<b>1,141,736</b>	<b>703,488</b>
		=====	=====

**INVESTING ACTIVITIES**

Purchase of Property, Plant and Equipment	9 &11	(218,398)	(808,099)
Intangible Assets	12		(203,775)
Capital Work-In-Progress	10	(2,000)	(77,876)
Proceeds from the Sales of Asset	9b		90,620

**Net Cash (used in) Investing Activities** (220,398) **(999,130)**

**Net (Increase) in Cash & Cash Equivalent** **921,338** **(295,642)**

Cash & Cash Equivalents at Beginning of Year 322,985 618,627

**Cash & Cash Equivalents at End of Year** **1,244,323** **322,985**

## NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31<sup>ST</sup> DECEMBER 2016

### **SUMMARY OF SIGNIFICANT ACCOUNTING POLICIES**

The significant accounting policies which have been adopted by the Public Utilities Regulatory Commission in the preparation of these Financial Statements are disclosed under the appropriate headings in the notes below.

#### **Basis of Accounting**

These accounts have been prepared under the historical cost convention. The reporting framework for the purpose of this year's account is the International Public Sector Accounting Standards.

#### **Comparative Figures**

The comparative figures covered the year ended 31<sup>st</sup> December 2015. However, where considered necessary, comparative figures have been reclassified to achieve consistency with presentation of current year figures.

#### **Property, Plant & Equipment**

These are stated at cost or fair value less aggregate depreciation as per the Property, Plant and Equipment schedule.

Depreciation has been provided on the straight line basis in order to write off the values of the assets over their estimated useful lives as follows:-

<i>Motor Vehicles</i>	5 Years
<i>Computer and Accessories</i>	3 Years
<i>Furniture &amp; Fittings</i>	5 Years
<i>Office Rehabilitation</i>	5 Years
<i>Leasehold Land</i>	50 Years

#### **Revaluation of Property, Plant & Equipment**

It is the policy of the Commission to revalue its Properties, Plant and Equipment every 5 years based on a professionally Qualified Valuer's Certificate. The carrying value is determined by the fair value at the date of revaluation less any Accumulated Depreciation and subsequent Accumulated Impairment. The revaluation shall be made to ensure that the carrying amount does not differ materially from that which would be determined using Fair Value at the end of the reporting year.

#### **Foreign Exchange Conversion**

All transactions denominated in foreign currencies are recorded in Ghana Cedis (GH¢) at the rate of exchange ruling on the date of the transaction. Monetary balances denominated in foreign currencies are expressed in Ghana Cedis (GH¢) at the rate of exchange ruling as at the Statement of Financial Position date.

#### **Intangible Assets**

##### Initial Measurement

Intangible assets are measured at cost less accumulated amortization and any accumulated impairment losses. Amortization is charged so as to allocate the cost of intangibles less their residual values over their estimated useful lives, using the straight-line method. A useful life of 3 years is used to amortize Softwares.

#### **Subsequent Measurement**

If there is an indication that there has been a significant change in amortization rate or residual value of an asset, the amortization of that asset is revised prospectively to reflect the new expectations.

#### **Cash and Cash Equivalents**

Cash and Cash Equivalents are defined as cash in hand, demand deposits and short term investments in marketable securities that are readily convertible to known amounts of cash and subject to insignificant risk of changes in value. For the purpose of cash flow statement, cash and cash equivalents consist of cash on hand and bank deposits net of any outstanding bank overdrafts.

#### **Employee Benefits**

##### **Defined Contribution Plans**

A defined contribution plan is a post-employment benefit plan under which an entity pays fixed contributions to a separate entity and will have no legal or constructive obligation to pay future amounts. Obligations for contributions to defined contribution schemes are recognized as an expense in profit or loss when they are due.

The Commission is required to contribute 13% of employees' basic salary to the Social Security and National Insurance Trust and 5% to a Fund Manager under the terms of the Pension Act 2008 (Act 766).

NOTES TO THE FINANCIAL STATEMENTS FOR THE YEAR ENDED 31<sup>ST</sup> DECEMBER 2016

		<u>2016</u> <u>GH¢</u>	<u>2015</u> <u>GH¢</u>
3)	<b>Regulatory Levy</b>	<b>41,159,655</b>	<b>37,717,896</b>
		=====	=====
	<i>This consists of the following inflows:</i>		
	Electricity Levy	16,595,302	11,409,751
	Natural Gas Levy	24,564,353	26,308,145
4)	<b>Donor &amp; Others</b>	<b>906,822</b>	<b>4,443,260</b>
		=====	=====
	<i>This consists of the following inflows:</i>		
	Other Non-Regulatory Income      SCH.I	906,822	4,443,260
5)	<b>Personnel Cost</b>	<b>SCH.II</b>	<b>10,679,981</b>
		=====	=====
	<i>This consists of the Salaries and other benefits to Staff</i>		

6)	<b>Commissioners' Allowances</b>	SCH.III	<b>617,400</b>	<b>522,550</b>
This consists of Allowances paid to Commissioners as ratified by the Office of the President.				
7)	<b>Administrative Expenses</b>	SCH.IV	3,367,294	<b>3,509,106</b>
These include:				
	Audit Fees		35,250	35,250
	Depreciation		815,167	981,110
8)	<b>Operational Expenses</b>	SCH.V	<b>6,328,848</b>	<b>6,072,952</b>
This consists of Expenses on Operational Activities of the Commission as per Section 3 of Act 538, 1997.				
=====				

9a) **PROPERTY, PLANT AND EQUIPMENT**

<b>2016</b>	<b>Leasehold</b>	<b>Motor</b>	<b>Computer &amp;</b>	<b>Office</b>	<b>Furniture &amp;</b>	
<b>COSTS</b>	<b>Land GH¢</b>	<b>Vehicle GH¢</b>	<b>Accessories GH¢</b>	<b>Equipment GH¢</b>	<b>Fittings GH¢</b>	<b>Total GH¢</b>
Balance at 1 <sup>st</sup> January	4,865,894	2,200,045	360,830	1,184,813	258,146	8,869,728
Additions during the year	-		71,823	123,694	22,881	218,398
Disposal	-			-	-	-
	-----	-----	-----	-----	-----	-----
Balance at 31 <sup>st</sup> December	4,865,894	2,200,045	432,653	1,308,507	281,027	9,088,126
	=====	=====	=====	=====	=====	=====
<b><u>ACCUMULATED DEPRECIATION</u></b>						
Balance at 1 <sup>st</sup> January	398,847	1,143,377	262,030	594,011	133,110	2,531,375
Charge for the year	99,204	325,577	67,097	207,181	47,944	747,003
Disposal	-			-	-	-
	-----	-----	-----	-----	-----	-----
Balance at 31 <sup>st</sup> December	498,051	1,468,953	329,127	801,192	181,054	3,278,378
	=====	=====	=====	=====	=====	=====
<b><u>NET BOOK VALUES</u></b>						
31 <sup>st</sup> December, 2016	4,367,842	731,092	103,526	507,315	99,974	<b>5,809,748</b>
	=====	=====	=====	=====	=====	=====

	<b><u>2015</u></b>	<b>Leasehold</b>	<b>Motor</b>	<b>Computer &amp;</b>	<b>Office</b>	<b>Furniture &amp;</b>	
a)	<b><u>COSTS</u></b>	<b><u>Land</u></b> <b><u>GH¢</u></b>	<b><u>Vehicle</u></b> <b><u>GH¢</u></b>	<b><u>Accessories</u></b> <b><u>GH¢</u></b>	<b><u>Equipment</u></b> <b><u>GH¢</u></b>	<b><u>Fittings</u></b> <b><u>GH¢</u></b>	<b><u>Total</u></b> <b><u>GH¢</u></b>
	Balance at 1 <sup>st</sup> January	4,865,894	1,578,165	326,341	1,128,693	258,146	8,157,239
	Additions during the year	-	712,500	39,479	56,120	-	808,099
	Disposal	-	(90,620)	(4,990)	-	-	(95,610)
		-----	-----	-----	-----	-----	-----
	Balance at 31 <sup>st</sup> December	4,865,894	2,200,045	360,830	1,184,813	258,146	8,869,728
		=====	=====	=====	=====	=====	=====
b)	<b><u>ACCUMULATED DEPRECIATION</u></b>						
	Balance at 1 <sup>st</sup> January	299,643	868,689	207,762	369,310	83,879	1,829,283
	Charge for the year	99,204	307,915	54,545	224,705	49,231	735,596
	Disposal	-	(33,227)	(277)	-	-	(33,504)
		-----	-----	-----	-----	-----	-----
	Balance at 31 <sup>st</sup> December	398,847	1,143,377	262,030	594,011	133,110	2,531,375
		=====	=====	=====	=====	=====	=====
c)	<b><u>NET BOOK VALUES</u></b>						
	31 <sup>st</sup> December, 2015	4,467,047	1,056,668	98,800	590,802	125,036	<b>6,338,353</b>
		=====	=====	=====	=====	=====	=====

NOTES TO THE FINANCIAL STATEMENTS  
FOR THE YEAR ENDED 31<sup>ST</sup> DECEMBER 2016

		¤ <u>2016</u>	<u>2015</u>
		<u>GH¢</u>	<u>GH¢</u>
9b)	<b><u>Disposal of Property and Equipment</u></b>		
	Cost	-	95,610
	Accumulated Depreciation	-	(33,504)
		-----	-----
	Carrying Amount	-	62,106
	Sales Proceeds	-	(90,620)
		-----	-----
	Profit on Disposal	-	(28,514)
		=====	=====
10)	<b><u>Capital Work-In-Progress</u></b>	<b>3,986,321</b>	<b>3,984,321</b>
		=====	=====
	This represents expenditure to date on the Commission's proposed 15 Storey Office Complex at African Liberation Circle, Accra.		
11)	<b><u>Rehabilitation Expenditure</u></b>		
	Balance as at 1 <sup>st</sup> January	919	34,419
	Additions	-	-
	Amount Written Off	(241)	(33,500)
		-----	-----
	Balance as at 31 <sup>st</sup> December	<b>678</b>	<b>919</b>
		=====	=====
	This represents Rehabilitation works on the Commission's Rented Office Building which is being written off over 5 years.		
12)	<b><u>Intangible Asset</u></b>		

Balance as at 1 <sup>st</sup> January	1,211,646	1,007,871
Addition	-	203,775
	-----	-----
Balance as at 31 <sup>st</sup> December	1,211,646	1,211,646
	=====	=====
<b><u>Amortization</u></b>		
Balance as at 1 <sup>st</sup> January	1,032,060	820,046
Charge for the year	67,925	212,014
	-----	-----
Balance as at 31 <sup>st</sup> December	1,099,985	1,032,060
	=====	=====
Net Book Value	<b>408,738</b>	<b>179,586</b>
	=====	=====

NOTES TO THE FINANCIAL STATEMENTS  
FOR THE YEAR ENDED 31<sup>ST</sup> DECEMBER 2016

		<u>2016</u> <u>GH¢</u>	<u>2015</u> <u>GH¢</u>
13)	<b>Account Receivables and Prepayments</b> <b>SCH.VI</b>	<b>199,809,178</b>	<b>116,915,528</b>
		=====	=====
14)	<b>Cash and Bank</b>	<b>1,244,323</b>	<b>322,985</b>
		=====	=====
	<i>These Consist of</i>		
	Cash on Hand	42,221	61,993
	Cash at Bank	1,202,102	260,992
	<b>Capital Surplus</b>	<b>4,495,651</b>	<b>4,495,651</b>
15		=====	=====
	This resulted from the revaluation of office Property at 51 Liberation Road, Ridge, Accra on 9 <sup>th</sup> November, 2011 by Bortey Consulting, Valuers and Estate/Project Managers, Estate Brokers.		
16	<b>Accounts Payables</b> <b>SCH.VII</b>	<b>160,393,897</b>	<b>98,246,634</b>
		=====	=====

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17      **Analysis of the balances of Cash & Cash  
Equivalents**

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Cash & Bank	(Note 14)	1,244,323	322,985
		=====	=====

For the purposes of the statement of cash flows, cash equivalents include bank and cash balances.

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NOTES TO THE FINANCIAL STATEMENTS  
FOR THE YEAR ENDED 31<sup>ST</sup> DECEMBER 2016

<u>SCHEDULES TO THE FINANCIAL STATEMENTS</u>	<u>2016</u>	<u>2015</u>
	<u>GH¢</u>	<u>GH¢</u>
<b><u>Schedule I</u></b>		
<b><u>Non-Regulatory Income</u></b>		
Ghana Water Company Limited	117,000	90,000
Sales of Tender Document	5,700	2,300
Management Fees	-	-
Profit on Disposal of assets	-	28,514
Realized/Unrealized Exchange Gain	-	3,138,735
Sundry Income	775,595	1,127,735
Interest on Call Account	8,527	55,976
	-----	-----
	<b>906,822</b>	<b>4,443,260</b>
	=====	=====
<b><u>Schedule III</u></b>		
<b><u>Personnel Cost</u></b>		
Salaries & Allowances	7,931,100	7,799,784
Medicals	417,424	341,284
Overtime Allowances	28,845	186,568
Temporal Staff & National Serv. Allowances	23,364	26,273
Staff Transfer Expenses	-	46,475
Other Allowance	658,911	-
Staff Life Policy Insurance	53,053	-
Employer's contributions to Pension Funds	1,567,284	1,433,317
	-----	-----

	<b>10,679,981</b>	<b>9,833,701</b>
=====	=====	=====

#### **Schedule IV**

##### **Commissioners' Allowances**

Commissioners' Allowances	237,750	194,866
Commissioners' Sitting Allowances	379,650	327,684
	-----	-----
	<b>617,400</b>	<b>522,550</b>
	=====	=====

NOTES TO THE FINANCIAL STATEMENTS  
FOR THE YEAR ENDED 31<sup>ST</sup> DECEMBER 2016

<u>Schedule VI</u>	<u>2016</u>	<u>2015</u>
	<u>GH¢</u>	<u>GH¢</u>
<b><u>General Administrative Expenses</u></b>		
Insurance	51,293	40,368
Rent	199,889	251,271
Electricity and Water	308,812	181,165
Post and Telecommunications	343,026	246,666
Motor Vehicle Running Cost	458,762	382,468
Audit Fees	35,250	35,250
Bank Charges	28,116	25,810
Security	113,968	111,986
Adhoc Sub Committees	31,389	237,640
Statutory Committee Sitting Allowance	57,563	-
Protocol Expenses	20,620	
Printing and Stationery	467,066	449,285
Travelling and Transport	40,235	70,756
Welfare Expenses/Honorarium	37,608	24,598
General Repairs and Maintenance	85,710	274,671
Corporate Social Responsibility	42,410	5,000
Office Cleaning and Sanitation	97,882	81,328
Computer Software Amortization	-	212,014
Amortization of Rehabilitation Expenses	-	33,500
Depreciation	815,167	735,596
Exchange Loss	-	8,504
Professional Fees	124,841	66,444
Loose Tools	7,687	4,717
Bad Debt	-	30,069
-----		

	<b>3,367,294</b>	<b>3,509,106</b>
=====	=====	=====

### **Schedule VII**

#### **Operational Expenses**

Travelling and Transport	45,845	415,058
Training and Conferences	2,675,708	2,013,034
Printing and Publication	9,100	3,710
Materials and Consumables	311,332	26,815
Commissioners Technical Sub-Committees	504,025	378,802
Public Relations and Related Expenses	203,536	44,807
Monitoring and Trips	333,973	36,630
Tariff and Rate Setting Expenses	391,309	542,335
Special Program Expenses	-	2,611,761
Local Legal Expenses	15,550	-
Protocol	98,435	-
Other Allowances	1,740,035	-
	-----	-----
	<b>6,328,848</b>	<b>6,072,952</b>
	=====	=====

NOTES TO THE FINANCIAL STATEMENTS  
FOR THE YEAR ENDED 31<sup>ST</sup> DECEMBER 2016

	<u>2016</u> <u>GH¢</u>	<u>2015</u> <u>GH¢</u>
<b><u>Schedule VIII</u></b>		
<b><u>Accounts Receivables and Prepayments</u></b>		
GRIDCO Limited	62,335,547	40,946,253
Ghana National Gas Company Limited	137,133,529	75,722,646
Staff Debtors	131,853	108,069
Imprest Debtors	100,000	-
Rent Prepaid	33,249	81,775
Insurance Prepaid	75,000	56,785
	-----	-----
	<b>199,809,178</b>	<b>116,915,528</b>
	=====	=====

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**Schedule IX**  
**Accounts Payables and Accruals**

Energy Commission	39,420,574	23,985,686
Rural Electrification	68,535,219	42,910,435
Due to Pro Poor	48,919,098	28,946,448
Sundry Creditors	3,519,006	2,404,065
	-----	-----
	<b>160,393,897</b>	<b>98,246,634</b>
	=====	=====

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**As at the time of this report the audited accounts for 2017 were not finalised for inclusion in the report**

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## **Appendix I: Net Metering**

### **PUBLIC UTILITIES REGULATORY COMMISSION (PURC)**

#### **PUBLICATION OF NET METERING RATE FOR PURCHASE OF CUSTOMER-GENERATED RENEWABLE ENERGY BY ELECTRICITY DISTRIBUTION UTILITIES**

In accordance with the statutory duty imposed on PURC under sections 3(a), 3(b), 16, and 18 of the Public Utilities Regulatory Commission Act, 1997 (Act 538) and sections 4(e) and 5(a) of the Renewable Energy Act, 2011 (Act 832), this publication of net metering rate is made this 30<sup>th</sup> September 2016.

1. Net metering is a billing-related scheme designed to encourage electricity customers to supplement their purchase of electricity with grid-connected renewable energy self-generation.
2. The net metering rate approved by the PURC consists of energy exchange between the Customer-generator and the distribution utility in terms of Kilowatt-Hour (kWh), and shall be valid for the duration of the Net Metering Agreement.
3. The net metering quantity shall be determined from the energy produced by the Customer-generator and the energy supplied by the distribution utility company to the Customer-generator.

#### **Net Metering Credits**

4. The net metering quantity shall be in the form of credit to the Customer-generator if there is net energy exported to the grid and a charge to the Customer-generator if there is net energy imported from the grid.
5. One (1) Net Metering Credit shall be offered for each kWh generated by a net-metered generating unit within a billing period.
6. Net Metering Credits shall attract the prevailing rate approved by the PURC to ensure rate uniformity for all qualified net metering customers at any given time.
7. Distribution utilities shall apply the net metering credits against energy (per-kWh) charges on a Customer-generator's bill. The net energy (kWh) supplied from the distribution utility to the Customer-generator shall be tiered and the appropriate tier rate used to determine the customer consumption charges of electricity.
8. Net Metering Credits are not applicable to non-energy related charges (such as demand charges, customer charges (fixed monthly charges), taxes, levies, or any other fees or surcharges).
9. All non-energy related charges shall be based solely on the total energy consumption from the distribution utility system to the customer generating system.

10. Monthly Net Metering Credits shall be accrued and rolled-over from one billing cycle to another within a calendar year or until the end of the Transition Period, after which the credits shall expire.
11. If a Customer-generator terminates service with a distribution utility with which it has executed a Net Metering Agreement, the distribution utility shall not compensate the Customer-generator for any Net Metering Credits accrued in the Customer-generator's account at the time of service termination.
12. A distribution utility's liability to a Customer-generator in respect of Net Metering Credits shall not be affected by any change in ownership of the distribution utility.
13. If a distribution utility terminates service with a Customer-generator because of a change in ownership of the distribution utility, the distribution utility that has executed a Net Metering Agreement must compensate the Customer-generator for any accrued Net Metering Credits, provided these credits have not yet expired.
14. The installation of the Customer – generator Net Metering System shall comply with the Net Metering Code issued by the Energy Commission.

**Validity of Net Metering Rate**

15. A Net Metering Rate shall be valid for the duration defined in the Net Metering Agreement.
16. The duration of a Net Metering Agreement shall not unduly infringe on the rights of the Customer-generator or distribution utility to terminate in accordance with the Net Metering Code.

**Revenue Neutrality for Net Metering**

17. A Distribution utility shall include the cost associated with the net metering scheme as part of its tariff proposal to PURC in accordance with Act 538, Act 832 and the PURC Rate Setting Guidelines for Distribution Utilities.

**Renewable Energy Purchase Obligation**

18. Implementation of the net metering scheme shall be considered as part of the Renewable Energy Purchase Obligation (REPO) of a distribution utility.

**Net Metering Enrolment Quantity**

19. The PURC in consultation with the Energy Commission may, from time to time, set the size of enrolment quantity for each distribution utility's net metering scheme, considering the following:
  - a) The associated costs of the net metering scheme.
  - b) The total allowable installed capacity in Megawatt (MW) for each distribution utility's net metering scheme.

## DEFINITIONS

The following terms shall have the meanings prescribed in this publication. Other terms used in this publication but not defined shall have the same definitions prescribed in the Net Metering Code issued by the Energy Commission.

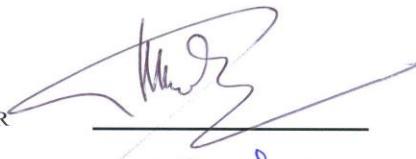
<b>Avoided cost</b>	A benchmark set by the PURC to reflect the long-run marginal cost of additional generation, transmission and distribution, which is avoided through Customer-generators' use of energy from their net-metered generating units.
<b>Billing period</b>	A monthly meter reading taken on a specific day of the month.
<b>Enrolment Capacity Threshold</b>	A designated limit on total production capacity (MW) that a distribution utility may enrol in its net metering scheme at any given time. Once this limit has been fully subscribed, the Energy Commission in consultation with the PURC shall approve a new enrolment capacity threshold before additional Customer-generators may be enrolled.
<b>Enrolment phase</b>	A period for which net metering shall be extended to new Customer generators consistent with the Net Metering Code.
<b>Net Metering Agreement</b>	A fixed-term agreement between the distribution utility and Customer-generator for the purchase of excess energy exported by the Customer-generator to the grid.
<b>Net Metering Credit</b>	Renewable energy generated by a Customer-generator in excess of their own consumption which is supplied to the grid to offset the customer's total energy consumption supplied by the distribution utility company.
<b>Transition Period</b>	A period of two years following the date of approval of these rates by PURC.



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Dr Emmanuel K. Annan  
Chairman, Public Utilities Regulatory Commission

MR. SAMUEL L. ADETOLA

COMMISSIONER



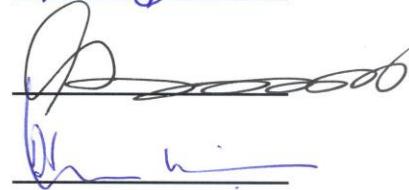
MR. DAVID AMETEFE

COMMISSIONER



MAJOR ALBERT DON-CHEBE (RTD.)

COMMISSIONER



MR. DANIEL OWUSU-KORANTENG

COMMISSIONER



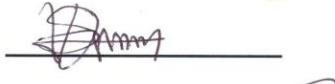
DR. FERDINAND D. TAY

COMMISSIONER



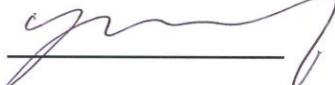
MR. SAMUEL SARPONG

COMMISSIONER



DR. YAW ADU GYAMFI

COMMISSIONER



MR. STEPHEN AKUOKO

COMMISSIONER



## Appendix II: PURC Benchmark for Compliance Assessment of Energy Utilities

<b>Compliance Status</b>	<b>Rating</b>	<b>Description of Compliance</b>
Compliant (High)	5	Compliant with no further action required to maintain compliance.
Compliant (Medium)	4	Compliant apart from minor or immaterial recommendations to improve the strength of internal controls to maintain compliance.
Compliant (Low)	3	Compliant with major or material recommendations to improve the strength of internal controls to maintain compliance.
Non-compliant	2	Does not meet minimum requirements.
Significantly non-compliant	1	Significant weaknesses and/or serious action required.
Not Applicable	N/A	Determined that the compliance obligation does not apply to the licensee's business operations.
Not Rated	N/R	No relevant activity took place during the audit period therefore, it is not possible to assess compliance.