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Your Ref .....

Our Ref MD/PURC/V7/024 Date 9th November, 2018

The Executive Secretary,
PURC,
P. O. Box CT 3095,
Cantonment, Accra.

PUBLIC UTILITIES
RECEIVED
12 NOV 2018
REGULATORY COMMISSION

Dear Madam,

RE: SUBMISSION OF TARIFF PROPOSAL FOR 2019 MAJOR TARIFF REVIEW

Reference is made to your letter dated 8th October 2018 requesting the Electricity Company of Ghana (ECG) to submit its proposal for the 2019 major tariff review.

We hereby submit ECG's tariff proposal for the 2019 major review. This is made up of the 2019 Tariff Proposal and completed tariff filing forms sent via email to dufieofori@yahoo.com and mofori@purc.com.gh.

The information is provisional since the asset audit and revaluation exercise is not yet completed. Additionally, the GoG analysis on the lease payments is expected to be completed by 23rd November 2018. We envisage to submit the confirmed numbers by end of November, 2018.

Yours faithfully,

for **ING. S. BOAKYE-APPIAH**
(MANAGING DIRECTOR)

(2) Sedina
Pls make copies as directed.
12/11/18.

cc: The Honourable Minister, Minister of Energy

ELECTRICITY COMPANY OF GHANA

TARIFF PROPOSAL FOR RESTRUCTURED ECG

DRAFT REPORT

NOVEMBER 2018

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1.0. Introduction

The Electricity Company of Ghana (ECG) received the tariff approval effective March 15, 2018 upon making a submission to the PURC for consideration. The approved tariff increased the Distribution Service Charge (DSC) from GH¢0.22176/kWh to GH¢0.307555/kWh (a 14.33% increase). Subsequently, ECG has been implementing the approved tariff and monitoring its impact to ensure that the assumptions and results are being achieved. This is required to help achieve the following:

- Provide stakeholders with accurate feedback on the impact of the tariff
- Monitor the impact of the new tariff on ECG's operations and revenues
- Monitor the inherent policies on ECG's customers and electricity users
- Monitor customer responses to the tariff adjustments
- Provide feedback to stakeholders on consumer behaviour and impact on existing and new policies on electricity consumption

In this tariff submission, ECG intends to provide feedback on the above areas and make suggestions and recommendations on future implementation of tariffs. Additionally, the impending Private Sector Participation (PSP) arrangement for ECG requires that a tariff reform is done to enable the unbundling of electricity rates for market participants and ensure that institutional performance is strictly monitored and rewarded accordingly.

In this regard, ECG has prepared a tariff proposal to cover its operations in the month of January 2019, and the lease payments as well as operations and maintenance costs when the concessionaire begins operations. Hence, Restructured ECG's (RECG) cost shall commence from February 2019 with the scope of operations listed below:

- Role of responsible asset owner
  - Monitoring and evaluation
  - Energy trading
  - Corporate Services
  - Finance and Procurement

The remaining roles of RECG which includes a fully functional Training School, Energy and Telco services, Utility Technical Consulting and Business Development. These areas are not tariff related and therefore excluded from the tariff submission.

The following sections contain ECG's tariff proposal.

2.0. Impact of The Prevailing Tariff Effective 15 March, 2018

ECG has done a comparison of the current tariff assumptions with actuals and discuss them as follows:

2.1. Power Generation Cost

Presently, ECG incurs higher power generation cost than has been approved in the present tariffs. From January to August 2018, the PURC approved Bulk Generation tariff (BGT) effective March 15, 2018 is GH¢0.42997/kWh as against actual

generation cost of GH¢0.5714/kWh. This translates into an accumulated cost (unrecovered pass-through generation cost of GH¢1.2b (equivalent to USD267.2m). The table below provides the details of the cost distribution on a plant by plant basis.

TABLE 1

No	Power Producers	PURC Tariff Assumptions				Actual Dispatch and Invoices - January to August 2018							Exchange Rate Losses - GHS
		Annual Energy (kWh)	January - August (kWh)	Tariff (GHp/kWh)	Tariff (US¢/kWh)	Energy (kWh)	Amount (USD)	Amount (GHS)	Idle Capacity Charges - USD	Tariff (GHp/kWh)	Tariff - Excl Idle Cap. (US¢/kWh)	Tariff (US¢/kWh)	
1	VRA	4,627,000,000	3,084,666,667	29.9100	6.53	2,808,350,621.15	171,472,660	788,552,429	-	26.61		5.94	-
2	Sunon Asogli Phase I	528,000,000	352,000,000	51.8161	11.70	428,680,808.00	59,814,979	269,934,643	-	62.97		13.95	(10,909,171)
3	Sunon Asogli Phase II	1,414,000,000	942,666,667	51.3063	11.54	782,677,808.00	102,370,124	459,825,836	-	58.75		13.08	(38,722,743)
4	CENIT	381,908,000	254,605,000	74.8526	16.90	-	26,274,286	112,412,992	25,985,409	-		-	(4,264,385)
5	BXC	756,800,000	504,000,000	45.3652	10.24	377,702,500.00	38,676,726	172,241,085	-	45.60		10.24	(8,165,147)
6	Karpower	2,708,000,800	1,805,333,333	58.7078	11.45	2,883,332,620.00	377,759,657	1,681,368,184	31,392,202	81.39	16.63	18.13	(78,829,240)
7	AKSA	458,000,000	172,000,000	55.6813	12.55	902,226,630.00	141,976,979	632,406,594	31,508,792	104.83	18.26	23.49	(32,982,044)
8	CENPOWER	1,861,000,000	307,333,333	64.0086	14.45	10,848,800.00	1,960,836	8,969,355	-	82.95	-	18.41	(237,720)
9	Twigan I	-	-	-	-	-	-	-	-	-			-
10	Twigan II Terra	-	-	-	-	-	-	-	-	-			-
11	Twigan II Kumasi	-	-	-	-	-	-	-	-	-			-
12	BXC Solar	26,000,800	17,333,333	88.2882	20.14	19,052,461.75	3,856,632	16,361,986	-	85.88		20.14	-
13	Safisana	780,000	486,667	73.4295	16.38	161,276.00	28,085	125,368	-	77.73		17.41	(9,208)
14	Meinergy Technology Ltd	-			-	-	-	-	-	-		-	-
	Total	17,519,709,000	8,339,808,000			7,194,248,808.90	923,897,166	4,132,225,573	USD (88,886,403)				1154,622,202
	Actual Composite Bulk Generation Tariff (GHS/kWh) - (PURC CBGT = 35.97 & 42.97TH)			41.2488				57.4199					
	PURC Tariff Assumption - Exchange rate (GHS:USD) - Average				4.27925								
	Market Rate (GAB)				4.52921								
	PURC												
	Unrecovered Generation Cost (GHS)				8.2012884								

The above unrecovered cost are broken down into three broad categories as follows

- Forex Losses - GH¢ 154.62m (USD34.15m).

  The dollar/cedi exchange rate which was assumed to be 4.43 per dollar was 4.92 per dollar as at end of June, 2018. This is 11% higher than the PURC assumed exchange rate.

- Variations in Dispatch - GH¢157.69m (USD34.82m)

  It is observed that the volumes of energy projected by the PURC (with the explanation that the 2018 Supply Plan was used) for individual power plants created gaps in the volume of power dispatched and therefore adverse price variations. The effect of this is an observed shortage in revenues required to pay for power generation cost as invoiced by individual plants.

  The assumption that the Karpowership (KPS) will move from Tema to Sekondi (the naval base) from the beginning of year 2018 and therefore the use of domestic NG to price energy produced by KPS was an unrealized projection. The new timelines for the movement of the ship is around April 2019. Additionally, the rate of GH¢0.5560 used for the AKSA plant in the 2018 approved tariff was far lower than the observed rate of GH¢0.8629.

- Take-or-pay (cost of standby capacity) - GH¢402.50m (USD88.89m)

  Take-or-pay costs come three forms. First the spinning reserve which is required for a healthy power system to properly operate and therefore must be paid for as pass-through cost; the non-spinning reserves which must be available always on

call by the transmission utility; and lastly the excess plant capacities which will always be idle until demand grows or major plants are faulty and cannot operate.

2.2. Fuel Prices

Inherent in the above unrecovered generation cost is souring fuel prices. PURC's assumptions in the recent tariff adjustment are currently lower than the observed market prices. Natural Gas (NG)was assumed to be USD7.29/MMBtu as against the actual price of USD9.09/MMBtu as at June 2018 (i.e. 25% higher than assumed). Light Crude Oil (LCO) was assumed to be USD68/barrel. Its current price as at end of June 2018 was USD77.7/barrel (an increase of 14%). Similarly, Heavy Fuel Oil (HFO), which was assumed to be USD390/mt was USD461/mt as at end of June, 2018 (an increase of 18%).

The table below provides a comparison of the PURC tariff assumptions and actual rates observed as at end of June 2018.

TABLE 2

COMPARISON BETWEEN PURC TARIFF ASSUMPTIONS AND ACTUALS (JAN - JUNE 2018)					
Item No.	Item Description	Units	PURC Tariff Assumption	Actuals (Jan-June 2018)	COMMENTS
A	**Generation**				
1	Fuel Prices				
	Natural Gas	USD/MMBTu	7.29	9.09	25% higher than the tariff assumption
	LCO	USD/Barrel	68	77.66	14% higher than the tariff assumption
	HFO	USD/Metric Tonne	390	461	18% higher than the tariff assumption
2	Allocation of Legacy Hydro to ECG	GWh	2,237	?	Assessment of the actual power generation to ECG
3	Bulk Generation Charge (BGC)	GH¢/kWh	0.42997	0.5415	26% higher than the tariff assumption. Implied unrecovered power generation costs amounts to USD137.48million (GHS607.98million)
4	Assumptions on power generation plants	Aksa plant was priced on NG instead of HFO. KPS was assumed to be in Takoradi and therefore fuelled with NG. Contracted Volumes of electricity under the PPAs were understated. Reserve Margin and standby capacities were not included in the generation			
5	Exchange Rate (USD/GH¢ Rate)	$1:GH¢	4.43	4.92	11% higher than the tariff assumption
B	**Distribution**				
4	Annual Energy	GWh	12,060	5,449	90.4% of PURC's projection
5	System Losses	%	21%	23.89%	13.8% higher than the PURC assumption
6	Revenue Collection	%	98%	84%	14% lower than the PURC benchmark
7	Customer Population Growth	%	32%	0.60%	Only 1.9% of the target is achieved
8	Distribution Service Charge (DSC)	GH¢/kWh	0.30755	0.12179	ECG is recovering only 40% of the approved DSC. Translates to GH¢525.9m
9	End User Tariff (EUT)	GH¢/kWh	0.78493	0.7107	A further 9% under-recovery in EUT is observed. Translates to GH¢210.1m

2.3. Distribution Operations

2.3.1. Projected Energy Demand

The forecasted annual energy was 12,060GWh. If we compare the six months version to the actual which is 5,449GWh, we achieve 90% of ECG's annual projection. However, the additional assumption to sell 40% of the projected

excess capacity which was planned in the ECG budget for 2018 has not yet been achieved.

The projected growth in customer population according to the March 15, 2018 approved tariff was 32%. As at end of June, 2018, ECG had achieved only 1.9% of that target, leading to a growth in customer population of 0.6%.

2.3.2. Customer Groups and Applicable Tariff

It is also observed that certain classes of customers are still paying for very high tariffs compared to the cost of service. Unfortunately, these customers have the capacity and are easily able to switch their consumption from grid to captive generation therefore, leaving the transmission and distribution network stranded and the non-recovery of any applicable cross subsidies. The table below provides an assessment of the tariff broken into the various customer bands.

TABLE 3

ANALYSIS OF ECG CUSTOMER PROFILE AND SALES REVENUE (JAN - JUNE 2018)						
CUSTOMER CATEGORY	ACTIVE CUSTOMERS	ENERGY CONSUMPTION (kWh)	MAXIMUM DEMAND (kVA)	*SALES WITHOUT LEVIES BILLED (GHS)	**REVENUE COLLECTED (GHS)	AVERAGE END USER TARIFF (Gh¢/kWh)
PREPAID & POSTPAID CUSTOMERS						
NSLT (Residential)						
0- 50	1,294,299	135,991,154		73,523,878	286,377,546	0.5407
51- 150	784,239	451,963,671		281,262,186	249,845,921	0.6223
151- 300	397,628	544,067,568		337,298,224	286,465,644	0.6200
301- 600	208,328	495,790,315		300,244,554	218,505,442	0.6056
600+	217,604	495,373,167		302,051,859	180,155,603	0.6097
Sub Total -Residential	2,902,097	2,123,185,876		1,294,380,700	1,221,350,156	0.6096
NSLT (Non Residential)						
0 - 300	344,586	83,204,756		53,787,704	129,531,275	0.6464
301- 600	70,700	64,034,004		30,194,098	29,765,830	0.4715
600+	79,331	320,888,145		365,573,613	309,044,433	1.1393
Sub Total -NSLT	494,617	468,126,905	-	449,555,415	468,341,538	0.9603
SLT						
SLT - LV	892	245,816,700	52,121	278,949,904	188,795,740	1.1348
SLT - MV	459	741,308,937	200,302	551,632,210	519,840,171	0.7441
SLT - HV	85	285,182,484	332,120	169,381,032	130,977,434	0.5939
SLT - HV (MINES)	3	4,338,194	279,411	5,029,399	90,303,110	1.1593
Sub Total -SLT	1,439	1,276,646,315		1,004,992,546	929,916,455	0.7872
Total Customers	3,398,153	3,867,959,096	-	2,748,928,661	2,619,608,149	0.7107

From the above table, non-residential customers with consumption beyond 600 units pay about GH¢1.14/kWh when the average tariff realized is about GH¢0.71/kWh.

2.3.3. Non-Realized End User Tariff

The approved tariffs give an End User Tariff (EUT) of GH¢0.785/kWh. The application of the approved rates with customer consumption and the revenue impact leads to GH¢0.716/kWh (a gap of 0.09% which translates into about GH¢54m per month).

It was further observed that the approved tariffs actually lead to an increase in consumption for some classes of customers, particularly for residential 0-50, 51-150. This lead to GoG's intervention where some subsidies were applied to the life line rate (0-50) and consumption between 51 -150. This translated to an amount of GH¢45.9m over a twelve-month period, hence the EUT is GH¢0.711 instead of the approved GH¢0.785. The following three tables provide an analysis of this:

TABLE 4

SUMMARY OF RESULTS (SCENARIO FOR TOTAL ECG CUSTOMERS)

CUSTOMER CATEGORY	CUSTOMER CATEGORY	PURC APPROVED TARIFF 2015	APPROVED TARIFFS 2018 WITH SUBSIDIES	APPROVED TARIFFS 2018	DIFFERENCE IN REVENUE	PERCENTAGE CHANGE
			(GH¢/kWh)	(GH¢/kWh)	(GH¢)	(%)
	Residential					
RESIDENTIAL	0- 50	0.3356	0.2606	0.2769	(10,378,368)	-5.9%
	51- 150	0.6733	0.5141	0.5554	(35,495,374)	-7.4%
	151- 300	0.6733	0.5554	0.5554	0	0.0%
	301- 600	0.8738	0.7209	0.7209	0	0.0%
	600+	0.9709	0.8010	0.8010	0	0.0%
	Service Charge		6.3317	6.3317	0	
	Sub Total -Residential				**(45,873,742)**	**-1.6%**
	Commercial					
NON-RESIDENTIAL OR COMMERCIAL	0 - 300	0.9679	0.6775	0.6775	0	0.0%
	301- 600	1.0299	0.7210	0.7210	0	0.0%
	600+	1.6251	1.1376	1.1376	0	0.0%
	Service Charge		10.5529	10.5529	0	0.0%
	Sub Total -NSLT				-	**0.0%**
	SLT					
SLT - LV	Capacity Charge	59.0960	59.0960	59.0960	0	0.0%
	Energy Charge	1.0089	0.7566	0.7566	0	0.0%
	Service Charge	42.2114	42.2114	42.2114	0	0.0%
SLT - MV	Capacity Charge	50.6537	50.6537	50.6537	0	0.0%
	Energy Charge	0.7809	0.5857	0.5857	0	0.0%
	Service Charge	59.0960	59.0960	59.0960	0	0.0%
SLT - HV	Capacity Charge	50.6537	50.6537	50.6537	0	0.0%
	Energy Charge	0.7176	0.5382	0.5382	0	0.0%
	Service Charge	59.0960	59.0960	59.0960	0	0.0%
SLT - HV MINES	Capacity Charge	59.0960	59.0960	59.0960	0	0.0%
	Energy Charge	1.1397	1.0257	1.0257	0	0.0%
	Service Charge	59.0960	59.0960	59.0960	0	0.0%
	Sub Total -SLT				**0**	0.0%
	Total Customers				(45,873,742)	**-0.7%**
AEUT			**0.7107**	**0.7156**	(0.0050)	

ITEM DESCRIPTION	CURRENT	APPROVED RATES	PERCENTAGE CHANGE
		15-Mar-18	%
BGC	**35.9673**	**42.997**	**19.54%**
TSC_1	-	2.5106	-
TSC_2	-	1.6976	-
Regulatory Levy	0.217	0.5330	145.62%
Total TSC	**5.5845**	**4.7412**	**-15.10%**
DSC_1	12.546	18.6638	48.76%
DSC_2	9.63	12.0917	25.56%
Total DSC	**22.176**	**30.7555**	**38.69%**
EUT	63.7278	78.4937	23.17%

3.0. Structure and Scope of ECG's Operations Post Concession/Transfer Date

3.1. Structure of RECG

The structure and human resource requirement of RECG as approved by the Board is shown in the organogram below:

FIGURE 1

3.2. Scope of RECG

RECG has been proposed in the PSP transaction document is for Restructure ECG to be an energy trader and the owner of the kWh. By this role, all the Power Purchase Agreements (PPAs) and the responsibility for procurement of bulk power shall be

performed by the RECG. additionally, as a responsible asset owner, ECG will put a mechanism in place to monitor the operations of the Concessionaire and enter into an Agency Agreement where the following broad areas of operation will be assigned to the Concessionaire to act as an agent on behalf of RECG:

- Management of the portfolio PPAs;
- Management of SHEP;
- Collection of outstanding balances/receivables from customers; and
- Capital-Works-in-Progress (CWIPs), where RECG elects to nominate the Concessionaire as an agent.

The following key Directorates will be used to perform the functions of RECG:

- Responsible as the asset owner (the asset monitoring function);
- Energy trading with the aim to sell more power across Ghana's borders;
- Development of a Training Center of Excellence;
- Provision of data and telecom services using the fiber-optic network;
- Exploring the Renewable Energy (RE) market in Ghana; and
- Provision of consultancy services.

The above scope can be categorized into two business models to be operated by RECG as a responsible asset owner. These are the focus business models and the opportunistic business models.

3.2.1. Focus Business Model

- RECG is a bulk energy trader of any excess energy available under signed/existing PPAs which may be beyond the consumption of the Concessionaire. RECG would export the surplus energy to neighbouring countries in order to offset the capacity charges and realize profits depending on the market conditions.

- RECG will utilize its Training Center to provide training services to electric utilities, electrical sub-contractors and electrical staff of bulk customers. The geographical focus will be on both Ghana and West Africa.

- RECG will provide high value-added technical services to distribution system operators in West Africa. This would include the provision of services in system planning, system design, large scale project management and advance methods for operation and maintenance.

- RECG will provide energy and telco services by renting out its existing dark fiber network to large telecom customers. In addition to providing communication and data services to the concessionaire to support prepayment metering, SCADA systems, network automation schemes and remote control systems to support the concessionaire's operations.