



Updated and Final Summary of Key Findings from 2022-2027 Multi-Year Major Tariff Proposals Submitted by Utility Service Providers

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CHAPTER 1 INTRODUCTION

1.1 Background to 2022-2027 Multi-Year Water, Natural Gas and Electricity Tariff Review

The Public Utilities Regulatory Commission, under the Public Utilities Regulatory Commission Act, 1997 (Act 538) is mandated to regulate service provision both in terms of rate examination and approval as well as monitoring of quality of service delivery by water, natural gas and electricity utility companies to end-consumers. The utilities currently being regulated as per Act 538 are Ghana Water Company Limited (GWCL), Ghana National Gas Company (GNGC), Volta River Authority (VRA), Ghana Grid Company Limited (GRIDCo), Electricity Company of Ghana Limited (ECG), Northern Electricity Distribution Company (NEDCo) and Enclave Power Company (EPC).

In addition to its regulatory oversight responsibilities relating to the public utilities noted above, Section 17 of Act 538 also enjoins the Commission to interrogate the cost of production, where a regulated utility service provider, procures a service from another source other than its own sources. This regulatory mandate is extended to Ghana National Petroleum Corporation (GNPC), though not recognised by law as a regulated public utility, but by virtue, both of its commodity and related costs being pass-through in electricity generation.

1.2 Legal Framework of PURC's Rate Setting and Request for Tariff Proposal Submissions

The legal foundation of PURC's Water, Natural Gas and Electricity Rate Examination and Approval including submission of underlying tariff proposals are succinctly provided for in Sections 16(3 a-d), 17-22 of the Public Utilities Regulatory Commission Act 1997, (Act 538). In particular, Act 538 states in above sections, when approving/setting rates, the Commission shall take into account the following factors.

1. Consumer interest (Section 16)
2. Investor interest (Section 16)
3. Assurance of reasonable cost of production of the service (Sections 16 and 17)
4. Assurance of the financial viability of the Public Utility (Section 16)
5. Economic development of the country (Section 20)
6. Best use of natural resources (Section 20)
7. Appropriateness of uniform tariff structures throughout the country (Section 20)

1.3 Executed Preliminary Actions

Pursuant to foregoing legal requirements which have been operationalised via various Water, Natural Gas and Electricity Rate Setting Guidelines as approved to guide discharge of the Commission's mandate, the Secretariat executed a number of key preparatory and preliminary actions in respect of the 2022-2027 Multi-Year Major Tariff Review. These actions are stated below:

1. February 03, 2021

Utility service providers were invited to a Pre Tariff Filing Meeting for the 2021-2026 Multi-Year Major Tariff Review. The objective of the meeting was to discuss Tariff Filing Templates and Tariff Review Process in order to ensure uniformity in tariff proposal submissions by all utility companies. To that end, the Commission submitted soft copies of the Filing Templates and Tariff Process for review by utility companies ahead of the said meeting.

2. On February 15, 2021

Utility companies were reminder to officially submit comments to the Commission as agreed in order to enhance the Tariff Filing Templates.

3. March 01, 2021

Following receipt of comments from utility companies on the Tariff Filing Templates, the Commission arranged a follow up virtual meeting with utility companies to discuss and conclude on comments which were received from the utility service providers.

4. March 11, 2021

Financial and Technical Templates as well as hard copies of the Commission's Tariff Process were issued to utility companies with the request to submit completed templates and documentation as well as any enquiries or clarifications in respect of approval of water, natural gas and electricity rates chargeable for provision of these services to end-users over the 2021-2026 Multi-Year Tariff Control Period.

5. March 17 and March 18, 2021

The Secretariat held stakeholder virtual meetings with utility service providers including the Ghana National Petroleum Corporation to discuss various Rate Setting Guidelines which were earlier submitted for their study and comments. As a follow up to the stakeholder virtual meetings held on March 17 and March 18, 2021, final comments were invited from utility service providers on the revised draft guidelines for review and incorporation into the Draft Final Rate Setting Guidelines for submission to Commissioners for approval and implementation. Specifically, utility companies were requested to provide their comments on Draft Rate Setting Guidelines for Electricity Distribution and Supply and Rate Setting Guidelines for Procurement and Supply of Electricity Generation Capacity and Energy in the Regulated Electricity Market.

6. April 06, 2021

In response to request by the utility service providers for extension of deadline for submission of tariff proposals, the Secretariat notified the utility companies of its decision to extend submission deadlines to April 20, 2021, reminding the utilities of the legal obligation imposed on them by the PURC Act, 1997 (Act538) to furnish accurate and reliable information to the Commission.

7. May 05, 2021

Following receipt of tariff proposals from the utilities, invitation was extended to all utility service providers for have preliminary discussions of the tariff proposals which the companies had submitted to the Commission. The objective of the meeting was to bridge any possible gaps in the tariff proposals and find ways to addressing those gaps. To that end, each utility company was expected to present key highlights of their proposals and any addenda submitted.

8. March 16, 2022

The Secretariat requested the utility service providers to re-submit their tariff proposals by incorporating new events and developments which have emerged and impacted the tariff proposals which were previously submitted. In addition, the tariff proposals were to reflect

the new tariff control period of 2022-2027. The deadline for re-submission of tariff proposals was March 30, 2022 while reminding the utilities of the legal obligation imposed on them by the PURC Act, 1997 (Act 538) to furnish accurate and reliable information to the Commission.

9. April 12-14 & 19, 2022

Following receipt of tariff proposals from the utilities, invitation was extended to all utility service providers for preliminary discussions of the tariff proposals with the Technical Committee of the PURC Board and the PURC Tariff Team. The objective of the meeting was to bridge any possible gaps in the tariff proposals and find ways to addressing those gaps. To that end, each utility company was expected to present key highlights of their proposals and any addenda submitted.

1.4 Conclusion

Following execution of above tasks including submission of tariff proposals by utility service providers, a preliminary review of the proposals was conducted. Key findings from the preliminary review are presented in this report. The report is structured in five Chapters. Chapter 1, which is the introductory chapter, provides background to the 2022-2027 Multi-Year Major Tariff Review, legal framework of PURC's rate setting and request for tariff proposals as well as preliminary actions executed to date. Chapter 2 highlights key issues relating to the urban water industry value chain tariff proposal dwelling on GWCL's Production, Transmission, Distribution and Supply as well as revenue requirement levels required to meet service delivery. Chapter 3 presents preliminary review of tariff proposals relating to Ghana's natural gas industry value chain, in particular, gas commodity and related services costs, processing and transmission assets and operational costs for GNPC and GNGC vis-à-vis revenue requirement levels for the gas value chain. Chapter 4 dwells on tariff submissions with regards to electricity generation, transmission, distribution and supply for VRA, GRIDCo, ECG, NEDCo and EPC. Finally, Chapter 5 presents Conclusions and Recommendations in respect of review of the proposals received from Utility Service Providers.

CHAPTER 2 URBAN WATER INDUSTRY VALUE CHAIN TARIFF PROPOSAL REVIEW

2.1 GHANA WATER COMPANY LIMITED (GWCL)

GWCL's tariff proposal highlights key issues and the need for upward review in the Company's average end-user water tariff by PURC. The company presented a summary of their proposed tariff both by cost item and customer category, rationale for level of tariff being proposed, underlying economic, technical as well as financial assumptions. Key findings from preliminary review of the proposal are presented in the following sections.

2.1.1 Proposed Water Tariffs

A summary of GWCL's proposed water tariffs by cost item and customer category is presented in Table 2-1 and Table 2-2.

Table 2-1 Summary of Proposed Water Tariff by Cost Item for 2022-2027

Proposed Tariffs	Measure	Period (Year)						
		2021	2022	2023	2024	2025	2026	2027
GWCL OpEx	GHS/m ³	14.33	19.38	22.08	23.44	20.26	14.34	15.19
GWCL OpEx & Depreciation	GHS/m ³	19.43	24.69	27.16	28.33	23.92	16.65	17.46
GWCL OpEx & CRC	GHS/m ³	22.03	25.33	27.71	28.79	24.22	16.82	17.60
GWCL Grand Total	GHS/m ³	24.72	28.41	30.6	31.51	26.22	18.05	18.8
DESAL OpEx	GHS/m ³	19.14	24.12	24.85	25.61	26.40	27.30	28.59
GWCL OpEx & DESAL OpEx	GHS/m ³	14.55	19.62	22.21	23.55	20.49	14.66	15.51
GWCL OpEx, Depreciation & DESAL OpEx	GHS/m ³	19.42	24.66	27.05	28.20	24.01	16.91	17.73
GWCL OpEx, CRC & DESAL OpEx	GHS/m ³	21.90	25.27	27.57	28.64	24.31	17.07	17.86
GWCL & DESAL Grand Total	GHS/m ³	24.46	28.20	30.32	31.23	26.23	18.28	19.04

Source: 2022-2027 GWCL Tariff Proposal

Table 2-2 Summary of Proposed Water Tariff by Customer Category for 2022-2027

Categories	Existing Tariff	Proposed Tariff	Expected Sales	Expected Revenue	Customers
	GHp	GHp	m ³	GHS	No.
Residential					
0-5	329.2121	1149.7211	5,496,246	63,191,501	168,610
5 and above	560.2083	2483.9544	103,539,309	2,571,869,254	434,453
Bulk Supply		1149.7211	1,070,032	12,302,379	10
Non Residential	923.0390	3492.7398	1,532,436	53,524,002	16,907
Commercial	923.0390	4122.3598	22,303,164	919,416,652	48,940
Industrial	1111.8338	5013.9975	8,443,568	423,360,299	300
Public Distribution/Gov't Depts	718.6628	3186.5391	19,391,283	617,910,822	5,842
Public Standpipe	369.4489	1638.1304	4,918,822	80,576,716	9,596
Port & Harbour		60.0000	364,957	218,974	30
Total			167,059,817	4,742,370,599	684,688

Source: 2022-2027 GWCL Tariff Proposal

2.1.2 Rationale for Proposed Tariffs

GWCL put forward the following reasons underlying the Company's proposed tariff for 2022-2027.

2.1.2.1 Inability to Finance Capital Investments

A key issue raised in GWCL's proposal is the inability of the company to raise enough revenue to finance much needed capital investment projects. This has resulted in continuous unsatisfactory level of service provision to consumers. GWCL thus proposes to invest approximately USD 2.0Billion in water production, transmission and distribution to increase current urban coverage to 100% country-wide by 2025.

2.1.2.2 Inadequacy of PURC Approved Tariff

GWCL noted in their proposal that the current PURC Approved Tariff is not only inadequate but also the inability of the Commission to address the effect of exogenous factors on the tariff through the application of its Automatic Adjustment Formula has led to an erosion of the real value of the tariff in real terms. The implication of above according to GWCL is that the company is unable to undertake urgent repairs of assets, extensions as well as replacement of over-aged and obsolete equipment/pipelines resulting in the company not being able to meet its regulatory service delivery targets hence persistent customer complaints.

2.1.2.3 Debt Overhang

According to GWCL, the company is saddled with severe debt overhang resulting both from refusal of MDAs to pay their water bills and the Ministry of Finance's (MoF) continuous policy of State Owned Enterprises (SOEs) paying for grants and loans procured by the MoF and on-lend to SOEs. GWCL noted in their proposal that the inability of MDAs to pay their bills, coupled with the demand by the MoF and inability of the company to promptly pay its on-lend grants and loans have resulted in huge debt overhang for the company. In total, the debt overhang at the MoF and GWCL agreed interest rate of LIBOR plus 4% as submitted by the company amounts to USD 1.04 Billion or GHS 6.22 Billion. According to GWCL, the company is saddled with a monthly loan repayment of USD 7.93 Million (GHS 47.58 Million) which is 47.15% of average monthly revenue collection of GHS 100.90 Million.

2.1.2.4 Re-valuation of Assets

GWCL argues that the true replacement value of their assets as at the time of submission of this tariff proposal is GHS 17.2 Billion. The company thus expects a fair return on above regulatory asset base with a view to serving as a potential collateral to raising credits for investment in water supply systems so as to expand coverage and access.

2.1.2.5 Exchange Rate Fluctuation

A key issue of concern to GWCL as captured in their proposal for consideration by the Commission is exchange rate fluctuation. According to GWCL, the Ghana Cedi exchange rate of all major trading currencies with Ghana have consistently depreciated. GWCL noted that the impact of exchange rate fluctuation is that the real value of the tariff over time has been lost resulting in inability of the company to carry out the necessary operation and maintenance activities as well as undertake necessary investments in the water supply system hence the continuous agitation of consumers in the area of quality of service delivery.

2.1.3 Key Policy Issues for Tariff Consideration

GWCL proposed the following key policy issues for consideration.

2.1.3.1 New Rate Structure

As part of their tariff proposal, GWCL proposed renaming and re-grouping of its existing tariff structure. The company proposed renaming of domestic category as 'residential' while maintaining the current lifeline tariff block of 0-5m³. In addition, GWCL requested classification of shops, churches and mosques as 'Non Residential' from the Commercial category. GWCL further called for the merging of Special Commercial and Sachet Water Producers to form the 'Commercial category'.

2.1.3.2 Water Tariff for Ocean Going Vessels (Ghana Ports and Harbour Authority)

GWCL indicated that the current tariff approved by PURC for water sold by GHAPOHA to ocean going vessels was set at GHS 125.8682 per cubic meter which has led to reduction in water consumption of ocean going vessels by GHAPOHA. The Company noted that in 2021, average monthly consumption for ocean going vessels supplied for billing was 882m³ for both Takoradi and Tema ports constituting only 4% of their average monthly bulk consumption (23,632m³). In view of above, GWCL proposed only one separate tariff for all ports and harbours authority nationwide to address the issue.

2.1.3.3 Supply of Bulk Water and Related Tariff

GWCL noted that the company in June 2020 entered into an agreement with Community Water and Sanitation Authority (CWSA) where GWCL supplies bulk portable water to serve some communities in the Central Region at a negotiated rate of GHS 2.50 per cubic meter. GWCL pointed out that December 2021, an average volume of 58,811 m³ was supplied to CWSA. A new customer category known as Bulk Supply was proposed by GWCL as well as approval of tariff for bulk supply since other companies have requested GWCL to supply water to them at bulk supply rates.

2.1.3.4 GWCL Low Income Distribution Extension Fund

GWCL recommended in their proposal that, PURC should play a significant role in making water services available to low income dwellers in the country through the review and approval of a “GWCL Low Income Distribution Extension Fund”. According to GWCL, this policy when implemented by the Commission will enable the company to extend pipelines to low income communities and new consumers.

2.1.3.5 Customer Metering

In terms of customer metering as a cash flow enhancing strategy, GWCL proposes to deploy significant number of ultrasonic meters to customers in the Greater Accra Metropolitan Area during the tariff control period. These meters according to GWCL not only have they no moving parts and therefore do not require regular maintenance but also can be in service for a minimum of 10 years and a maximum of 20 years without a change in their measuring accuracy. In addition, the Company noted that the ultrasonic meters have an in-built throttle valves for remote open and close operations in the case of default, to which end GWCL provided full specifications of the ultrasonic meters for approval as part of its urgent investment requirements over the Tariff Control Period to help address billing challenges being faced by the company. In total, GWCL intends to deploy 74,928 ultrasonic meters per year at a cost of USD 19.18Million including installation. This project when fully executed will enhance the cash flow position of the company in terms of billing amounting to GHS 51.5 Million per month over the tariff control period.

2.1.4 Technical, Economic and Financial Assumptions

From a technical, economic and financial perspective, GWCL submitted underpinning assumptions shown in Table 2-3 with regards to its proposed tariffs.

Table 2-3 Summary of GWCL's Proposed Economic, Technical and Financial Projections for 2022-2027

Item	Measure	Cost By Regulatory Year						
		2021	2022	2023	2024	2025	2026	2026
Total Production	m³	321,800,000	325,500,000	332,200,000	338,900,000	438,700,000	673,300,000	673,300,000
Total Sales	m³	172,840,331	167,059,816	174,155,108	181,020,980	238,614,327	372,822,054	379,479,590
Non-Revenue Water	%	46%	49%	48%	47%	46%	45%	44%
Recurrent Expenditure								
Personnel Cost	GHS	273,390,205	328,068,246	410,085,307	512,606,634	640,758,292	800,947,865	1,001,184,831
Chemicals	GHS	44,074,199	70,518,718	78,980,964	90,828,108	118,984,822	185,616,322	207,890,281
Electricity Consumption	GHS	242,144,785	271,202,159	303,746,418	275,212,669	277,541,386	340,018,895	298,076,062
VAT/NHIS	GHS	51,364,045	57,527,731	64,431,058	74,095,717	82,987,203	92,945,668	104,099,148
Fuel	GHS	14,968,351	26,194,615	29,337,969	32,858,525	36,801,548	41,217,734	46,163,862
Materials	GHS	24,510,681	29,412,817	32,942,355	37,883,708	42,429,753	47,521,324	53,223,883
Reagents	GHS	919,493	1,103,392	1,235,799	1,421,169	1,591,709	1,782,714	1,996,640
Hiring of Equipment	GHS	1,076,668	1,292,001	1,447,041	1,664,098	1,863,789	2,087,444	2,337,937
Overheads	GHS	119,920,555	143,904,666	161,173,226	185,349,210	207,591,115	232,502,049	260,402,294
Bad Debts	GHS							
R&M	GHS	171,770,747	206,124,897	230,859,884	265,488,867	297,347,531	333,029,234	372,992,743
Financial Cost	GHS	3,344,058	3,745,346	4,194,787	4,824,005	5,402,886	6,051,232	6,777,380
Exchange Loss	GHS	994,224,025	1,441,624,837	1,513,706,078	1,589,391,382	1,668,860,951	1,752,303,999	1,839,919,199
Levies	GHS	17,781,929	19,915,760	22,305,651	25,651,499	28,729,679	32,177,240	36,038,509
Crop and Land Compensation	GHS	1,423,479	1,594,297	1,785,613	2,053,454	2,299,869	2,575,853	2,884,956
Pipeline Right of Way & Vegetatio	GHS	1,227,744	1,375,073	1,466,543	1,542,070	1,603,060	1,665,642	1,728,925
Contract Service	GHS	2,728,599	3,056,031	3,421,498	3,823,450	4,264,630	4,742,186	5,256,795
Capital Maintenance	GHS	275,434,387	308,486,513	341,843,136	381,194,304	424,360,892	471,214,426	521,927,744
New Service Connections & Repla	GHS	120,000,000	160,000,000	200,000,000	240,000,000	280,000,000	320,000,000	360,000,000
Cash Operating Expenses	GHS	2,360,303,950	3,075,147,097	3,655,363,327	4,038,340,869	4,652,859,116	5,216,689,827	5,627,613,187
Capital Recovery Cost								
Return on Assets (Cost of Equity)	GHS	374,674,636						
Interest on Loans (Cost of Debt)	GHS	53,747,528	100,912,599	90,574,108	80,235,617	69,897,126	59,558,635	49,220,144
Depreciation	GHS	841,537,857	841,537,857	841,537,857	841,537,857	841,537,857	841,537,857	841,537,857
Loan Repayment (Principal)	GHS	442,120,349	489,656,297	479,317,738	468,979,178	458,640,619	448,302,059	446,957,153
Sub-Total	GHS	1,712,080,370	1,432,106,753	1,411,429,702	1,390,752,652	1,370,075,602	1,349,398,551	1,337,715,154
GWCL Grand Total	GHS	4,072,384,320	4,507,253,850	5,066,793,029	5,429,093,521	6,022,934,718	6,566,088,378	6,965,328,341
Desalination								
Capacity Charge	GHS	102,286,800	144,906,300	152,151,615	159,759,196	167,747,156	176,134,513	184,941,369
Water Charge	GHS	9,467,280	13,254,192	13,916,902	14,612,747	15,343,384	16,110,553	16,916,081
Electricity Cost	GHS	42,921,886	45,067,981	47,321,380	49,687,449	52,171,821	54,780,412	57,519,433
Desalination Total Cost	GHS	154,675,966	203,228,473	213,389,896	224,059,391	235,262,361	247,025,479	259,376,883
Total Estimated Revenue Require	GHS	4,227,060,287	4,710,482,323	5,280,182,925	5,653,152,912	6,258,197,079	6,813,113,857	7,224,705,224

Source: 2022-2027 GWCL Tariff Proposal

2.1.5 Revenue and Cash Flow Enhancing Strategies

According to GWCL, a number of revenue enhancing projects in the area of production, transmission and distribution improvement works have either been completed or ongoing. In the area of water production, key improvement projects and works completed or ongoing include replacement of bridge wheels for a number of clarifiers, rehabilitation of raw water pumps including those for China Ghezouba Plant, replacement of filtrate gate valves and borehole pumps, reinforcement of concrete sedimentation tanks and installation of Automatic Voltage Regulators. With regards to transmission improvement works, replacement of weak and perforated sections of the transmission network according to GWCL were completed. The Company intends to further expand the existing network by an additional 1,508 km by end of year 2026 (i.e. target is to increase 2% of total network coverage each year progressively from 2021 to 2027) in order to enhance accessibility to water supply and efficiently distribute water from the Water Treatment Plants that are projected to come on stream during the tariff period.

GWCL noted that the company has since 2019 deployed 20 zonal bulk electromagnetic meters and sensors to measure flow to and from the three operational regions of GWCL - Accra East, Accra West and Tema.

In terms of revenue collection or cash inflows from the company's operations, GWCL noted that as at 2021, the company deployed 51,000 mechanical meters and 12,000 smart meters at a cost of GHS 30,750,000 and 80,000 smart meters at a cost of Euro 65.41 Million. In addition, the company noted

that a Control Room was set up for receiving, transmitting, and displaying the data from field devices whilst an online dashboard for data display and presentation which is available at the control room and all designated Engineers and officers of the company on their mobiles or computers. This electronic data collection equipment GWCL notes, is now able to accurately determine volume inputs across its three operational regions.

2.1.6 Technical, Commercial and Financial Efficiency Performance

In terms of technical, commercial and financial efficiency performance over the 2019-2020 tariff period and proposal for same over the 2022-2027 Multi-Year Major Tariff Review Period, GWCL submitted performance indicators presented in Table2-4.

Table 2-4 Summary of GWCL Technical, Commercial and Financial Indicators for 2022-2027

Performance indicator	Measure	Period (Year)								
		2019	2020	2021	2022	2023	2024	2025	2026	2027
Non-Revenue Water	%	50.75	39.14	45.66	49	48	47	46	45	44
Capacity Utilisation	%	84	88	85	85	86	86	86	86	86
Water Produced	Mm ³	300.50	317.10	321.80	325.50	332.20	338.90	438.70	673.30	673.30
Water Quality Compliance	%	95	95	95	95	95	95	95	95	95
Operating Cost per Authorized Consumption	GHS/m ³	28.64	16.68	24.46	28.20	30.32	31.23	26.23	18.28	19.04
Chemical Cost per Cubic Meter	GHS/m ³	0.14	0.14	0.14	0.22	0.24	0.27	0.27	0.28	0.31
Electricity Cost per Cubic Meter	GHS/m ³	1.06	1.22	1.05	1.15	1.25	1.18	0.94	0.72	0.68
Total Collection Ratio	%	81.2%	74.50	98.25	98.25	98.25	98.25	98.25	98.25	98.25
Labour Productivity	GHS/staff	838,829	653,135	821906						
Operating Ratio	%	4.60	2.44	3.49						

Source: 2022-2027 GWCL Tariff Proposal

A key issue highlighted by GWCL as captured in Table2-4 is the proposed continuous reduction in Non-Revenue Water from current level of 45.66% in 2021 to 44% in 2027.

2.1.7 Concluding Remarks on GWCL's Submission

The preliminary review and key findings from GWCL's 2022-2027 tariff submissions indicate that the Company to a very large extent is compliant with PURC's tariff proposal submission requirements. In light of that position, RED requests approval for analysis of GWCL's tariff submissions.

CHAPTER 3 NATURAL GAS INDUSTRY VALUE CHAIN TARIFF PROPOSAL REVIEW

3.1 GHANA NATIONAL PETROLEUM CORPORATION (GNPC)

Though GNPC per the Public Utilities Regulatory Commission Act 1997, (Act 538) is not a public utility regulated by the Public Utilities Regulatory Commission, by virtue of Section 17 of the Public Utilities Regulatory Commission Act 1997, (Act 538), the Commission has an indirect regulatory role in terms of the cost of the product or commodity the corporation deals in. Section 17 of Act 538 states that:

1. *In order to assess the cost of production of any service by a public utility for the purpose of this Act, the Commission may investigate and determine whether any expenditure incurred by the public utility is justified or reasonable.*
2. *Where the public utility does not itself produce or generate the service which it provides to consumers, but obtains it from another source, the Commission may investigate the cost of production or generation of the producer or generator in order to determine the reasonableness of the rate being charged or proposed to be charged for the service concerned.*

Thus, in line with requirements of Sections 17(1) and 17(2) and by virtue of GNPC's role as owner of domestic gas, which commodity and associated costs are critical in determination of volume of electricity generated and tariffs, has in fulfilment of its role made submissions in respect of adjustment in gas commodity prices for Sankofa, TEN and Jubilee Gas Fields.

3.1.1 Identified Key Issues

The following key issues were identified by GNPC as critical to the corporation's operations.

3.1.1.1 Cost Reflective Price

GNPC indicated in their tariff proposal that, to sustain gas investments, it was important that the final delivered gas price (Weighted Average Cost of Gas) approved by the Commission reflects fully the Weighted Average Gas Commodity Costs for the three gas fields noted above including Tema LNG. In that respect, GNPC submitted details in respect of gas volumes and prices presented in the following sections.

3.1.1.2 Gas volumes

In terms of volume, GNPC submitted an annual gas volume offtake commitment of approximately 359.4MMScfd. According to the Corporation, this gas volume is projected to increase annually to 480MMScfd in 2024 and 530MMScfd by 2025 as a result of LNG offtake obligations. These details are captured in Table-5.

Table 3-1 GNPC Projected Natural Gas Volumes 2022-2027

Item Description	Measure	2022	2023	2024	2025	2026
Gas Supply Source:						
Sankofa	MMScfd	180	180	180	180	180
Jubilee	MMScfd	116	112	112	112	112
TEN	MMScfd	9.4	12.6	13	13	13
LNG	MMScfd	54	125	175	225	225
Total	MMScfd	359.4	429.6	480	530	530

Source: 2022-2027 GNPC Tariff Proposal

3.1.1.3 WAGP Transportation Tariff

Regarding WAGP Transportation tariff, GNPC noted that the WAPCo transportation tariffs are subject to annual escalations as well as three-yearly reviews. GNPC indicated that the 2022 WAGP transportation tariff is actual, which has been escalated annually at the rate of 4.7% in 2023 and 2024, and then reducing gradually to the expected long term trend of 2% per annum. However, no assumptions were made for the three-yearly reviews which are subject to negotiation by Committee of Ministers.

3.1.1.4 PURC Regulated Charges

The Corporation reiterated its position that all PURC regulated charges, including gathering, transportation and processing should be revised after review of GNGC's costs as well as revenues from the sale of Natural Gas Liquids. In addition, GNPC indicated that the MoF pays the China Development Bank (CDB) loan hence GNGC's revenue requirement should not include the capital cost recovery of the Gas Processing Plant (GPP) and the Transmission pipeline.

3.1.2 Pricing Methodology

In terms of pricing methodology, GNPC submitted projected Weighted Average Commodity Costs, Gas price escalations and various cost projections per field as indicated in the following sections.

3.1.2.1 Weighted Average Gas Commodity Cost (WAGCC)

In GNPC's tariff proposal, the corporation noted that gas off-take, volumes from all sources (both domestic and imported) blended at their respective prices to determine a Weighted Average Gas Commodity Charge as captured in Table 3-2. According to GNPC, the weight or volume of each gas stream takes into account the following issues:

- i. GNPC's contractual obligations to upstream suppliers
- ii. GNPC engineers' estimation of minimum production flows required to sustain oil recovery
- iii. The opportunity cost of using alternative gas sources
- iv. The processing capacity of the Gas Processing Plant (GPP) and its effects on the profitability of Ghana Gas Company Ltd.

Table 3-2 Summary of Proposed Weighted Average Commodity Cost of Gas and Service Charges 2022-2027

Item Description	Measure	2022	2023	2024	2025	2026
*Weighted Average Commodity Cost	USD/MMBtu	6.5206	7.3848	7.7344	8.0212	8.3148
Weighted Aggregate GNPC Service Charges	USD/MMBtu	1.3937	1.2930	1.2090	1.1310	1.0557
Intermediation Service Cost	USD/MMBtu	0.0855	0.0855	0.0855	0.0855	0.0855
Gas Management Service Cost	USD/MMBtu	0.0659	0.0673	0.0657	0.0668	0.0686
WAGP Transmission Cost - (T'di-Tema)	USD/MMBtu	2.4248	2.5388	2.6581	2.7378	2.7926
VGIF Service Cost	USD/MMBtu	0.0150	0.0150	0.0150	0.0150	0.0150
West-Kumasi-Pipeline Financing Cost	USD/MMBtu	1.7817	1.7817	1.7817	1.7817	1.7817
Total	USD/MMBtu	7.9143	8.6778	8.9434	9.1522	9.3705

*Weighted Average Commodity Cost for Jubilee, TEN, Sankofa and LNG

Source: 2022-2027 GNPC Tariff Proposal

In addition, GNPC indicated that the Weighted Average Commodity Cost has been determined using pricing formulae in each upstream gas purchase contracts, together with the escalation factors as well as various other elements such as price floor and cap, pricing reviews as applicable. These details are presented in Table 3-3.

3.1.2.2 Gas Price Escalators

As part of GNPC’s tariff proposal, the company indicated that gas price escalation factors were factored into its price projections, details of which are presented in Table 3-3.

Table 3-3 Summary of Gas Price Escalation Factors by Gas Source

Gas Sources	Price (US\$/MMBtu)	Escalation Factor	Effective Date (Year 0) for Escalation	Actual/Expected Start Date
*Jubilee Foundation	2.90	n/a	n/a	Q4, 2014
Greater Jubilee (Post Foundation)	1.8	Indexed quarterly to 80% of US PPI and 20% of US CPI	2017	Q4, 2022
TEN Associated	0.50	Indexed quarterly by In / Io (i.e. the monthly United States Producer Price Indices for base quarter Q2, 2013)	2014	Q3, 2018
TEN Non- Associated	3.00	n/a	n/a	n/a
Sankofa	7.89	$\left[0.7 \times \frac{CPI_t}{CPI_0} + 0.3 \times \frac{HH_t}{HH_0} \right]$ Where: CPI = US Consumer Price Index HH = Henry Hub Index	2014	Q2, 2018
Tema LNG Project	n/a	Linked to Brent Crude oil price	n/a	Q2, 2022

*GNPC is currently re-negotiating the Jubilee post foundation gas price. GNPC has so far managed to reduce it from US\$2.35/MMBtu in 2017 dollars to US\$1.80/MMBtu in 2017 dollars. But this is subject to contract, which is yet to be completed.

Source: 2022-2027 GNPC Tariff Proposal

3.1.2.3 Cost Projections

GNPC put forward cost projections used in computation of the Corporation’s Weighted Average Gas Commodity Charge and Weighted Average Services Charge. These costs are presented in Table 3-4.

Table 3-4 Summary of GNPC Natural Gas Cost Projections for 2022-2027

Item Description	Cost By Regulatory Year (US\$/MMBtu)						Remarks
	2022	2023	2024	2025	2026	2027	
Commodity Costs (US\$/MMBtu)							
Sankofa – before price reduction kicks in	8.7215	9.1298	9.4494	9.7329	9.9275	10.1261	<ul style="list-style-type: none"> The price reduction negotiated by GNPC took effect from September 2021. The Sankofa gas price therefore reduced to US\$8.33/MMBtu in 2021 dollars and escalated to 8.7215/MMBtu in 2022 dollars. For the rest of the tariff period, it has been escalated at the rate of 4.7% in 2023 and 2024, and then reducing gradually to the expected long term trend of 2% per annum.
TEN	0.6198	0.6489	0.6717	0.6918	0.7056	0.7197	<ul style="list-style-type: none"> Due to on-going substitution arrangement between Jubilee and TEN flows, GNPC does not nominate TEN gas from 2019 to 2021. GNPC expects to continue not to nominate TEN gas until Q4, 2022, when Jubilee Foundation Volume is exhausted and Jubilee well-head cost to GNPC is no more zero. When this happens, it would help the WACOG for GNPC to nominate TEN gas.
Jubilee	2.2647	2.3711	2.4541	2.5277	2.5783	2.6556	<ul style="list-style-type: none"> Jubilee well-head cost remains zero until the Foundation Volume is exhausted – Q4, 2022. From 2023, Jubilee gas will be priced higher than TEN gas.
Tema LNG (expected to commence Q3, 2022)	7.7000	10.1004	10.1004	10.1004	10.1004	10.1004	<ul style="list-style-type: none"> Tema LNG is expected to commence gas supply in Q3 2022. The price for delivered gas from Tema LNG is linked to Brent Crude Oil price and so variable. But GNPC has negotiated a fixed price of US\$7.7/MMBtu for 2022. Beyond 2022, GNPC may negotiate an extension of the fixed pricing regime. Otherwise it will float with the Brent Crude Price. Delivered prices based on projected average Brent Crude oil price of US\$75/bbl is shown here. Once production starts, GNPC would require regular reconciliation with PURC to ensure over-recoveries and under-recoveries are reconciled.
Service Charges							
WAPCo Transportation Charges	2.4248	2.5388	2.6581	2.7378	2.7926	2.8484	<ul style="list-style-type: none"> This includes the tariff of US\$2.3398/MMBtu, WAGPA Regulatory Levy of US\$0.0600/MMBtu and the Pipeline Protection Zone (PPZ) Charge of US\$0.0250/MMBtu. These are the applicable 2022, and subject to annual changes and three-yearly reviews It must be noted that there will be some variability in the effective tariff depending on whether, and to what extent, the interruptible transportation service is used, which attracts a premium of US\$0.1579 as at 2022.
GNPC's Discount for TTIP Investment	0.1579	0.1653	0.1711	0.1762	0.1798	0.1834	<ul style="list-style-type: none"> GNPC is receiving discount on the transportation tariff to cover US\$35 million of its investments in the TTIP.
Gas Contract Management Charges	0.0843	0.0843	0.0843	0.0843	0.0843	0.0843	<ul style="list-style-type: none"> Charge for the first 200MMScfd of gas
	0.0432	0.0432	0.0432	0.0432	0.0432	0.0432	<ul style="list-style-type: none"> Charge for volume in excess of 200MMScfd
VRA Gas Interconnection Facility	0.0150	0.0150	0.0150	0.0150	0.0150	0.0150	
GNPC's Financing Service Costs	0.0855	0.0855	0.0855	0.0855	0.0855	0.0855	<ul style="list-style-type: none"> This tariff represents GNPC's fees and charges for the Sankofa US\$500 million Letter of Credit (LC); US\$ circa US\$85 million LC for Tema LNG; US\$8.1 million LC for transportation service on WAGP among others.
Aggregator Service Charges	0.1790	0.1790	0.1790	0.1790	0.1790	0.1790	<ul style="list-style-type: none"> This tariff represents GNPC's fees and charges for the Sankofa US\$500 million Letter of Credit (LC); US\$ circa 150 million LC Tema LNG; US\$8.1 million LC for transportation service on WAGP among others.

Source: 2022-2027 GNPC Tariff Proposal

3.1.3 Concluding Remarks on GNPC's Submission

The preliminary review of GNPC's projected gas volume by field and costs as submitted by the corporation highlights all the key issues for consideration by PURC in final determination of Weighted Average Gas Commodity Charge and Weighted Average Gas Services Charge for the corporation.

3.2 GHANA NATIONAL GAS COMPANY (GNGC)

As the utility mandated with responsibility for transportation of natural gas in the country, GNGC's tariff proposal covers upward adjustment in the Company's natural gas gathering, processing and transmission tariffs, rationale underpinning tariff submission and key policy issues for tariff consideration by PURC in its tariff decision making process for the company. Highlights of selected issues noted above are presented as follows.

3.2.1 Proposed Tariffs

The GNGC proposed cost of service - revenue requirement, expected throughput and tariffs in respect of natural gas gathering, processing and transmission for 2022-2027 Tariff Control Period. Data in respect of above is presented in Table 3-5 and Table 3-6.

Table 3-5 Summary of Proposed Natural Gas Gathering, Processing and Transmission Tariffs for 2022

2022 GNGC Tariffs	Measure	Gathering	Processing	Transmission	Total
Total Cost of Service	MUSD	19.39	41.67	71.40	132.47
Expected Through-put	MMBtu	52.00	48.08	99.09	199.17
Tariff	USD/MMBtu	0.373	0.867	0.919	2.159

Source: 2022-2027 GNGC Tariff Proposal

Table 3-6 Summary of Proposed Natural Gas Gathering, Processing and Transmission Tariffs for 2022-2027

Item Description	Measure	2022	2023	2024	2025	2026
Gathering Tariff	USD/MMBtu	0.373	0.358	0.149	0.153	0.156
Processing Tariff	USD/MMBtu	0.867	0.803	1.205	1.177	1.144
Transportation Tariff	USD/MMBtu	0.919	0.872	1.242	1.217	1.161
Total GNGC Tariff	USD/MMBtu	2.159	2.033	2.596	2.547	2.461

Source: 2022-2027 GNGC Tariff Proposal

3.2.2 Rationale for Proposed Tariffs

GNGC provided a number of reasons in support of the Company's proposed tariffs for the 2022-2027 Tariff Control Period.

1. Recovery of fixed operational expenses required to ensure uninterrupted operation of GNGC's facilities and the delivery of gas.
2. Recovery of the cost of investment.
3. Return on assets which facilitates repayment of the cost of capital and equity return to shareholders, thereby protecting the investor interest

3.2.3 Key Policy Issues for Tariff Consideration

GNGC proposed the following key issues for consideration.

1. Recovery of the cost of investment to include the Gathering pipeline
2. CDB assets and loan interest to be excluded from the Regulated Assets Base
3. NGLs to be retained as revenue by GNGC to offset part of the Natural Gas Processing Service Charge
4. Payment of the 14km Deep Water Offshore Pipeline to GNPC initiated and therefore must be included in GNGC's Regulatory Asset Base.

3.2.4 Pipeline Availability Enhancing Strategies

According to GNGC, a number of availability enhancing projects have been executed by the company to improve natural gas distribution and utilization. These projects include the Takoradi Distribution Station (TDS) Expansion Project which increased capacity of the Station from 150 mmscfd to 405 mmscfd and provided the needed flexibility for future power and non-power demand, TDS-WAGP Interconnection Project which enabled up to 250 mmscfd of indigenous gas to be transported from the West (Takoradi) to the East (Tema) enclave for power generation and industrial usage. Additionally, the project according to GNGC increased offtake and utilisation of Sankofa gas and reduced the take-or-pay obligation under the ENI agreement. The company further noted that its DS-SRMS Onshore Gas Pipeline allowed generation of 450 MW by Karpowership using natural gas instead of Light Crude Oil. This transmission pipeline also serves the Twin City Energy, generating up to 198 MW power to the national grid.

As part of the 2022-2027 Tariff Control Period investments for consideration by the Commission, GNGC submitted the following ongoing projects aimed at improving pipeline adequacy and security.

1. Anokyi Mainline Gas Compressor Station
2. Gas Processing Plant (GPP2) Train 2
3. Takoradi-Tema Onshore Pipeline project
4. Atuabo-Ivory Coast onshore pipeline project
5. Genser onshore pipeline project (Phase II)
6. GNGC–Jintao Limited/Marco Polo Limited Distribution Pipeline projects

3.2.5 Concluding Remarks on GNGC's Submission

The preliminary review of GNGC's proposed cost of service - revenue requirement, expected throughput and tariffs in respect of natural gas gathering, processing and transmission for 2022-2027 Tariff Control Period highlights all the key issues for consideration by PURC in final determination of Natural Gas Gathering, processing and Transmission Tariffs for the company.

CHAPTER 4 ELECTRICITY INDUSTRY VALUE CHAIN TARIFF PROPOSAL REVIEW

4.1 Introduction

This chapter covers preliminary review and key findings of tariff proposals in respect of the electricity value chain, that is generation, transmission and distribution. The first section is dedicated to the generation segment of the value chain highlighting key issues as captured by the Volta River Authority (VRA) in their tariff proposal as well as generation by Independent Power Producers (IPPs) with which ECG has signed Power Purchase Agreements (PPAs). The projected energy generation by both VRA and IPPs are aggregated into an Electricity Supply Plan for the 2022-2027 Tariff Control Period and presented by GRIDCo in their tariff proposal in Section 4.3. The second section dwells on tariff proposal in respect of Transmission Added Value (TAV) as submitted by the Ghana Grid Company (GRIDCo) whilst the last section of the Chapter captures tariff proposals in respect of Distribution Added Value (DAV) as submitted to the Commission by the Electricity Company of Ghana (ECG), Northern Electricity Distribution Company (NEDCo) and Enclave Power Company (EPC).

4.2 VOLTA RIVER AUTHORITY (VRA)

VRA's tariff proposal submission dwells on five key areas. These are proposed power purchase tariffs for Electricity Distribution Companies (DisCos namely ECG, NEDCo and EPC), prices for reactive power compensation, forecast electrical energy supply for regulated electricity market, rationale underpinning tariff submission and key policy issues for tariff consideration.

4.2.1 Proposed Power Purchase Tariffs for DisCos

VRA proposed power purchase tariffs and electrical energy allocation for DisCos – ECG, NEDCo and EPC as part of the Authority's tariff proposal for the 2022-2027 Tariff Control Period. Data in respect of above is presented in Table 4-1.

Table 4-1 Summary of Proposed Power Purchase Tariffs and Electrical Energy Allocation by DisCos

Item Description	Tariff (GHp/kWh)	VRA Electrical Energy Allocation By DisCos (GWh)			Total
		ECG	NEDCo	EPC	
Power Plant:					
Akosombo	19.5774	2,937.2	531.0	68.1	3,536.3
Kpong	35.5889	525.8	95.0	12.2	633.0
TAPCo	60.2050	1,062.4	940.5	0.0	2,002.9
TT1PP	69.2243		347.5	0.0	347.5
KTPP	70.0544		0.0	158.7	158.7
AMERI	68.0410	354.0	0.0	0.0	354.0
Navrongo Solar	98.1053		3.0		3.0
Lawra Solar	67.6800		10.0		10.0
Total VRA Generation		4,879.4	1,927.0	239.0	7,045.4
Weighted Bulk Generation Charge (GHp/kWh)		33.6643	49.5207	53.9037	38.6879

Source: 2022-2027 VRA Tariff Proposal

4.2.2 Reactive Power Compensation

In addition to the tariffs proposed for real power, VRA also proposed compensation for reactive power generation by the Authority. The Authority noted that reactive power generation is necessary to ensure transmission network system stability and security which the Authority has over the years provided. However, the current tariff regime has not addressed the issue of compensation or tariff

for the provision of reactive power hence the request by the Authority to the Commission to approve a cost reflective tariff for reactive power being provided by the Authority. A summary of the proposed reactive power charges is presented in Table 4-2.

Table 4-2 Summary of Proposed Reactive Power Charges by Power Plant

Power Plant	Measure	2022	2023	2024	2025	2026	2027
Akosombo	GHS/kVar/Month	426.18	466.69	499.72	565.98	556.21	610.65
Kpong	GHS/kVar/Month	475.54	509.84	552.52	590.28	592.13	620.2

Source: 2022-2027 VRA Tariff Proposal

4.2.3 Forecast Electrical Energy Supply

VRA presented forecast electrical energy supply by power plant for the regulated electricity market as shown in Table 4-3.

Table 4-3 Summary of VRA Forecast Electrical Energy Supply by Power Plant for Regulated Electricity Market 2022-2027

Item Description	Measure	2022	2023	2024	2025	2026	2027
Forecasted Supply:							
Akosombo GS	GWh	3525	3308	3145	2874	2874	2874
Kpong GS	GWh	645	605	575	526	526	526
TAPCo	GWh	2003	1999	1999	1999	1999	1999
TTiPS	GWh	348	348	487	521	860	1229
KTPS	GWh	139	146	150	158	158	158
AMERI	GWh	354	1062	1563	1713	737	787
VRA Renewable Plants:							
Navrongo Solar Plant	GWh	3	3	3	3	3	3
Lawra/Saleo Solar Plant	GWh	12	12	12	12	12	12
Kaleo 2 Solar Plant	GWh	0	24	24	24	24	24
Bongo Solar Plant	GWh	0	0	0	63	95	95
Kpong Floating Solar Plant	GWh	0	0	0	0	16	16
VRA Wind Power Projects	GWh	0	0	56	124	151	151
Pwalugu Hydro Project	GWh	0	0	0	60	110	110
Total VRA Renewable Generation	GWh	15	39	95	286	411	411
Total Forecasted VRA Supply for Regulated Electricity Market	GWh	7,029	7,507	8,014	8,077	7,565	7,984

Source: 2022-2027 VRA's Tariff Proposal

4.2.4 Rationale Underpinning VRA's Tariff Submissions

VRA put forward the following rationale as underpinning the company's tariff submissions.

1. To recover cost of power supply to the DISCOs and ensure the sustainability of VRA.
2. To recover cost of transmission losses.
3. To recover net cost of inadvertent power imports.
4. To recover cost of ancillary services to the National Interconnected Transmission System.
5. To recover any additional cost borne by VRA to ensure grid stability and uninterrupted power supply in the nation.

4.2.5 Key Policy Issues for Tariff Consideration

VRA proposed eight (8) key policy issues for consideration which are as follows:

4.2.5.1 Foreign Exchange Loss

The VRA in the proposal noted that the Authority has incurred significant losses in its operations as a result of payment for natural gas and operational spares in foreign currency while receivables from the regulated market are paid in local currency (Ghana Cedis). According to VRA, the average actual exchange rate for 2020 was GHS 5.596/USD and GHS 6.4892 /USD for 1st Quarter 2022 whilst the PURC exchange rate was GHS 5.3767/USD. VRA reported Exchange Losses for the period 2019 to 2021 amounting to GHS 1,407.24 Billion.

4.2.5.2 Payment for Power Supplies to DisCos

With regards to payment for power supplies to DisCos, VRA indicated in their proposal that despite introduction of the cash waterfall mechanism, absence of a balancing fund to cater for unpaid portion of power bills poses a challenge to sustainability of the Authority's operations.

4.2.5.3 Dispatch of Power Plants and Supply to ECG

VRA indicated that per the PURC Tariff projections, the Authority was expected to supply 4,903 GWh of electricity to ECG in 2020 which could not be attained due to unplanned generation by Independent Power Producers on account of GRIDCo/SCC. VRA was able to supply only 3,469 GWh to ECG resulting in significant revenue shortfall. VRA therefore proposed that the dispatch regime should be in accordance with PURC energy allocation.

4.2.5.4 Generation on Liquid Fuel

According to VRA, KTPS is called upon by the grid operator to generate power using DFO during periods of natural gas supply interruptions to prevent disruptions in power supply and contribute to grid stability. However, the PURC Approved Fuel Recovery Charge for KTPS was based on natural gas resulting in a fuel cost differential of USD 7.94Million in 2020.

VRA further noted in their submission that the Authority keeps strategic fuel stock as well as maintain a service contract for the Single Point Mooring (SPM) facility in Aboadze. The Authority noted that maintenance of the SPM costs USD 900,000/annum, in addition to an estimated opportunity cost of keeping the liquid fuel stock of USD 550,000 for 2020. To enable VRA to continue to provide this strategic service to the power sector, the tariff structure should make provision to cater for these costs which are incurred by VRA for the purpose of ensuring reliable power supply to the nation.

4.2.5.5 Inadvertent Power Exchanges

VRA indicated in their proposal that inadvertent power exchanges occur as a result of interconnection between Ghana and Cote d'Ivoire which help to sustain the reliability of the grid in both countries. This the Authority noted results in unplanned power imports which come at a cost higher than the PURC approved tariff by USD 0.12/kWh and thus, proposed that PURC should take this issue into consideration.

4.2.5.6 Ancillary Services

In terms of ancillary services, VRA noted that the Authority provides ancillary services such as black start, reactive power, spinning reserve and voltage/frequency regulation to ensure grid stability and continuity of supply which increases cost of power. However, payment for these ancillary services have not been addressed by PURC in the Commission's tariff approval for generators. In that regard,

VRA put forward a proposal that PURC should not only come out with a framework for payment for ancillary services including reserve margin but also see to full implementation of same.

4.2.5.7 Mini-Grid Maintenance

As part of their proposal, VRA indicated that the Authority has been granted the responsibility for operation and maintenance of mini-grids in the country by the Ministry of Energy. In this respect, the Authority has been carrying out operation and maintenance of mini-grids in five island communities. VRA further noted that the Authority is in discussions with the Ministry relating to the terms for operation and maintenance of three installations which the Ministry intends to hand over to the Authority. As captured in their proposal, additional mini-grids are being constructed which are at different stages of completion which will be handed-over to VRA as and when commissioned by the Ministry of Energy & Partners. VRA proposed that the PURC develop a tariff purposely for the operation and maintenance of mini-grid plants.

4.2.5.8 Payment for Unutilized Capacity

The issue of payment for unutilized capacity was raised by VRA in their 2022-2027 tariff proposal. The Authority noted that it has approximately 200MW of unutilized capacity in the Tema enclave as dedicated reserve capacity. The Authority also put forward the issue of no PPAs being signed on with DisCo off-takers, which should serve as a constant capacity revenue stream to address the issue of non-dispatched capacity of the Authority's generation assets. The associated liability for non-inclusion of the non-dispatched generation capacity in the Authority's tariff by the PURC has been estimated to cost the Authority some USD 22Million a year.

4.2.6 Plant Reliability Enhancing Strategies

According to VRA, a number of thermal power plant initiatives and projects aimed at enhancing reliability and affordability while ensuring sustainability were undertaken since July 2019 tariff review. These projects include TTPS-T1 - Refencing Of Takoradi Thermal Power Station ,rust control works, Supply Of Unit Power Transformer for Tema Thermal Power Complex – Station 2 (TT1PS) , TTPS-T1 Unit 2 Overhaul Gas Infrastructure Facility Upgrade in Tema carried out in 2020 whilst in 2021, the Authority embarked on Kpone Thermal Power Project (KTPP) Outstanding Works, TTPS Gas Interconnection Upgrade, Power Connection from GRIDCo to VRA's Gas Regulating and Metering Station In Tema, relocation of AMERI Power Plant to Kumasi and Asset Valuation for T3 Weather Protection enclosure for T1 Plant. VRA noted that total cost of the above projects amounted to GHS 47.36 Million.

With regards to generation efficiency projects to increase power supply capacity and supply reliability, VRA plans to over the next five (5) years to embark on Takoradi Thermal Power Plant (T1) life extension, conversion of KTPS to Combined Cycle as well as retrofitting of T3 Power Plant Project. These three projects are estimated to cost USD 410 Million.

4.2.7 Concluding Remarks on VRA's Submission

The preliminary review of VRA's proposed power purchase tariffs, electrical energy allocation, ancillary services charge for the 2022-2027 Tariff Control Period highlights all the key issues for consideration by PURC in final determination of power purchase tariffs for ECG, NEDCo and EPC as well as ancillary services charge.

4.3 GHANA GRID COMPANY LIMITED (GRIDCO)

GRIDCo's tariff proposal submission dwells on four key areas. These are proposed transmission tariffs, rationale for proposed tariffs, key policy issues for tariff consideration as well as economic, technical and financial assumptions.

4.3.1 Proposed Transmission Tariffs

GRIDCo's proposal for Transmission Service Charge (TSC-1) for 2022-2027 is presented in Table 4-4.

Table 4-4 Summary of Proposed Transmission Service Charge for 2022-2027

Tariff	Measure	2021	2022	2023	2024	2025	2026	2027	Average
Transmission Service Charge-1 (GRIDCo)	GHP/kWh	8.0488	8.9181	9.0411	10.0696	10.1103	10.3267	10.1197	9.5192

Source: 2022-2027 GRIDCo's Tariff Proposal

A comparative review of GRIDCo's existing TSC-1 of GHP 5.4398/kWh with proposed TSC-1 of GHP 8.9181/kWh for 2022, indicates a **63.94%** upward adjustment in TSC-1. However, average for the tariff control period indicate **74.99%** upward adjustment in the TSC-1.

4.3.2 Rationale for Proposed Tariffs

GRIDCo put forward the following rationale underpinning the company's tariff submissions.

4.3.2.1 Cost-Reflective Transmission Tariffs

According to GRIDCo, the current transmission service tariff of GHP6.03988/kWh (Including GHP0.600/kWh for ancillary and related expenditure) does not adequately reflect the cost of GRIDCo's operational activities. Additionally, deterioration in approved transmission tariff in US dollar terms from US Cents 1.02 /kWh in 2019 to US Cents 0.72/kWh in March 2022 notwithstanding increases Regulatory Asset Base over the years. The company therefore noted that a cost-reflective transmission tariff will ensure a reliable and stable NITS which will restore confidence in Ghana's power system for sustainable economic development.

4.3.2.2 Increasing Cost of Maintenance

In terms of maintenance of the transmission network, GRIDCo noted that the company is saddled with increasing cost of maintenance as a result of over 6,400 circuit km of the company's transmission lines located in densely forested vegetation, high incidence of corrosion on coastal transmission backbone and increased transformer capacity at most substations. According to the company, maintenance is critical to enhance reliability as required to resolve intermittent disruptions. To achieve this, the company requested for the right tariff to be able to maintain the various assets in the short to medium term to enhance efficiency.

4.3.2.3 Increasing Cost of Financing

With regards to cost of financing projects, GRIDCo indicated that the company is unable to secure direct loans to undertake medium to long term investments in the NITS as a result of non-cost reflective tariff which makes required return on most planned investments lower than cost of financing, thereby warding off potential investors. This according to the company limits funding sources to GRIDCo to mainly concessionary funding and grants.

4.3.3 Key Policy Issues for Tariff Consideration

GRIDCo proposed three (3) key policy issues for consideration which are as follows:

4.3.3.1 Ancillary Services Provision and Pricing

GRIDCo noted that as System Operator, requires reactive energy and other ancillary services to maintain system stability and voltage support, in line with the Grid Code. According to GRIDCo, ancillary services such as reactive energy support and black start are being provided by Bui Power Authority (BPA) and VRA (Akosombo Plant). In order to recover the cost for providing such services, GRIDCo proposed an ancillary service tariff (charge/kVarh) to formalise the arrangement for procurement of various ancillary services for all participants in accordance with the Grid Code.

4.3.3.2 Stranded Assets Resulting from Embedded Generation

With respect to stranded assets, GRIDCo brought to light that there is an increase in Bulk Customers connected to the NITS engaging in embedded generation for direct power supply. This has resulted in under-utilization of transmission capacity which can result in high cost of transmission for regulated transmission customers. GRIDCo therefore called for policy direction on how to deal with stranded assets as well as deployment of embedded generation.

4.3.3.3 Recovery of Third Party Owned Transmission Assets

GRIDCo put forward the issue of recovery of third party owned transmission assets. The company noted that it has been mandated to operate the NITS regardless of ownership hence maintain third party owned transmission assets including that of Bui Power Authority and the Karpowership Ghana Company. In that regard, GRIDCo proposed that the capital cost recovery of third Party assets excluded from the regulated asset of GRIDCo. GRIDCo proposed that, the Commission should rather consider operation and maintenance cost of third-party assets in GRIDCo's revenue requirement.

4.3.4 Electricity Supply Plan

The 2022 electricity supply plan indicating electrical energy consumption by customer and supply by generation plant as well as projected electrical energy consumption by customer for the period 2022-2027 are presented in Table 4-5 and 4-6 respectively.

Table 4-5 2022 Electricity Supply Plan Indicating Electrical Energy Consumption by Customer and Supply by Generation Plant

Customer Category	Projected Energy (GWh)
Projected Energy Consumption	
Domestic	20,860
VALCO	765
Export (CEB+SONABEL+CIE)	1,953
Total	23,579
Generation Sources:	
VRA Power Plants:	
Akosombo GS	5,513
Kpong GS	987
TAPCO	2,003
TICO	2,299
TT1PP	348
KTPP	375
TT2PP	112
AMERI Power Plant	572
VRA Solar(Navrongo)	3
VRA Solar(Kaleo)	22
VRA Solar(Lawra)	10
Imports From Cote d'Ivoire	-
IPP Power Plants:	
Bui GS	894
Bui Solar Farm	95
SAPP	2,069
CENIT	745
Karpowership	3,347
AKSA	249
CENPOWER	2,467
Twin City	1,415
BXC Solar	27
Meinergy	27
Safisana	1
Total Supply (GWh)	23,579

Source: 2022 Electricity Supply Plan

Table 4-6 2022-2027 Electrical Energy Consumption by Customer

Load Forecast: Energy (GWh)	2022	2023	2024	2025	2026	2027
ECG	15,817.28	16,769.21	17,574.25	18,660.07	19,891.59	21,444.87
NEDCo	1,903.73	2,163.66	2,428.94	2,610.71	2,795.55	2,963.82
ENCLAVE POWER COMPANY	283.80	384.48	407.37	421.10	448.56	466.87
MINES	1,406.06	1,628.14	1,991.68	2,118.46	2,425.63	2,482.30
DIRECT	379.25	595.79	745.44	811.83	845.24	924.64
VALCO	765.39	1,371.47	1,371.47	1,371.47	1,371.47	2,437.78
CEB(Togo/Benin)	650.00	650.00	743.59	743.59	743.59	743.59
SONABEL(Burkina)	1,051.20	1,314.00	1,314.00	1,314.00	1,384.80	1,454.04
CIE(Ivory Coast)	252.00	-	-	-	-	-
EDM(Mali)	-	-	-	-	-	352.15
Network Usage	11.07	12.08	12.90	13.62	14.52	16.15
LOSSES	1,058.71	1,094.23	1,173.92	1,260.51	1,429.03	1,633.98
Total	23,578.51	25,983.05	27,763.55	29,325.35	31,349.97	34,920.18

Source: 2022-2027 GRIDCo's Tariff Proposal

4.3.5 Technical, Economic and Financial Assumptions

From a technical, economic and financial perspective, GRIDCo submitted the following assumptions as presented in Table 4-7.

Table 4-7 Summary of GRIDCo's Economic, Technical & Financial Assumptions/ Projections 2022-2027

Item	Measure	Cost By Regulatory Year						
		2021	2022	2023	2024	2025	2026	2027
Electricity Available for Dispatch	GWh	20,682	23,542	25,949	27,727	29,284	31,299	33,215
Total Electricity Sales	GWh	19,695	22,520	24,889	26,590	28,065	29,921	31,716
Transmission Loss	%	5.01	4.54	4.26	4.28	4.35	4.61	4.73
Operation & Maintenance Costs	MGHS	75.56	112.31	140.94	163.25	187.17	225.35	251.95
Administrative & General Costs	MGHS	68.03	79.48	84.83	92.45	100.53	109.91	117.33
Human Resource Costs	MGHS	234.67	256.33	280.61	320.30	366.16	390.87	450.77
Depreciation	MGHS	155.95	200.45	213.31	227.18	244.91	250.82	259.91
Return on Regulated Asset Base	MGHS	815.63	1,033.74	1,164.58	1,436.42	1,470.92	1,525.34	1,587.49
Cost of Working Capital	MGHS	235.35	306.01	331.70	425.54	454.54	483.67	480.52
Corporate Tax	MGHS	0	20.03	34.25	12.31	13.23	103.87	61.61
Total Revenue Requirement	MGHS	1,585.19	2,008.35	2,250.22	2,677.45	2,837.46	3,089.83	3,209.58
RoRNFA	%	16	20	21	25	25	25	25
Regulatory Fixed Asset Base	MGHS	5,089	5,169	5,546	5,746	5,884	6,101	6,350

Source: 2022-2027 GRIDCo's Tariff Proposal

4.3.6 Reliability and Performance Improvement Strategies

According to GRIDCo, the company embarked on a number of transmission line and substation projects aimed at improving reliability of the NITS to enhance customer satisfaction. These transmission lines include the Prestea – Kumasi 330kV line, Aboadze – Prestea 330kV line, Kintampo – Adubuliyili 330kV line, Nayagnia – Paga 225kV line, Adubuliyili – Nayagnia 330kV, Tamale – Adubuliyili 161kV line, 330kV Kumasi-Bolgatanga Transmission Line Project, 161kV Volta – Achimota Transmission Line Upgrade Project, 330kV Accra Fourth Bulk Supply Point, Pokuase (Grant) and 330kV Karpowership - Aboadze Transmission Line Project.

Completed substations include the Nayagnia, Anwomaso, Adubuliyili, 161kV Kasoa Substation (Grant), Tamale and Kintampo Substations, Tamale and Bolgatanga 161kV substation upgrade and 330kV Aboadze Substation Expansion. The transmission lines together with substations in GRIDCo's submission cost an amount of USD 334.48 Million. Additionally, other medium-term projects are expected to be carried out within the 5-year Tariff Control Period at an estimated cost of GHS 815.53 Million

In terms of performance improvement, GRIDCo indicated that the company has put in place a new performance management process through the enterprise resource plan which has increased productivity, efficiency, and effectiveness in transmission service delivery.

4.3.7 Concluding Remarks on GRIDCo's Submission

The preliminary review and key findings from GRIDCo's 2022-2027 tariff submissions indicate that the Company to a very large extent is compliant with PURC's tariff proposal submission requirements. In light of that position, all key issues have been highlighted for consideration by PURC in final determination of transmission tariffs.

4.4 ELECTRICITY COMPANY OF GHANA (ECG)

ECG's tariff proposal covers adjustment in the Company's distribution service charge, rationale for level of tariff being proposed, key policy issues for tariff consideration as well as underlying technical, economic and financial assumptions. Key findings from preliminary review of the proposal are presented in the following sections.

4.4.1 Proposed Distribution Tariffs

ECG's proposed Distribution Service Charge attributable to distribution network business (DSC-1) for 2022-2027 is presented in Table 4-8.

Table 4-8 Summary of Proposed Distribution Service Charge for 2022-2027

Tariff	Measure	2022	2023	2024	2025	2026	Average
Distribution Service Charge-1 (ECG)	GHP/kWh	39.9513	44.5521	47.1524	50.0364	53.4509	47.0286

Source: 2022-2027 ECG Tariff Proposal

A comparative review of ECG's existing DSC-1 of GHP 16.1094/kWh with proposed DSC-1 of GHP 39.9513/kWh for 2022, indicates a **148%** upward adjustment in DSC-1. However, average for the tariff control period indicate **191.9%** upward adjustment in the DSC-1.

4.4.2 Rationale Underpinning ECG's Tariff Submission

ECG highlighted the following reasons as rationale underpinning the company's tariff submission.

4.4.2.1 Macroeconomic Factors

As part of the company's tariff submissions, ECG noted that instability of macroeconomic and market driven variables such as exchange and inflation rates have increased cost of both imported and local materials required by ECG to serve its customers. Additionally, ECG noted that the company bears the exchange rate risk in Power Purchase Agreements (PPAs). This the company noted has affected the company's financials considerably. According to ECG, inflation rate at the end of first quarter 2022 was 19.4% as against PURC's rate of 8% used over the last regulatory control period, while an actual exchange rate of GHS 7.6/USD was recorded as against PURC's approved existing rate of GHS 5.6737/USD. Additionally, ECG indicated that increasing inflation rates has also impacted on cost of borrowing to finance projects indicating that the weighted average inflation rate used in this tariff submission is approximately 7% based on the ratio of 20% and 80% for USA and Ghana respectively.

4.4.2.2 Investment Costs

In terms of investments, ECG stated that the company has undertaken regular investments to avoid the distribution effect of under critical investments. These huge investment costs according to the company was required to improve service delivery and thus has significant impact on the revenue requirements of the company. The company therefore noted that investment costs factored as part of their tariff proposal has been limited to completed and ongoing projects, committed investments as well as the most feasible investments.

4.4.2.3 Generation Costs

With regards to generation costs, the company the various prices agreed with IPPs and approved by the regulator have become a burden on the company as PURC gazetted tariffs indicate lower prices for generation as compared to actual prices in the PPAs. This ECG noted has resulted in huge unpaid IPP invoices in dollars with its associated forex losses.

4.4.2.4 Distribution Losses

According to ECG, distribution losses have been projected in line with the Memorandum of Understanding (MOU) signed between Energy Commission (EC) and ECG in November 2020. In view of above, the company requested PURC to apply same in its tariff determination as presented in Table 4-9.

Table 4-9 Summary of ECG System Loss Reduction Benchmark

Agreement Year	Percentage Point Reduction in Aggregate Technical and Commercial Loss Ratio Below Base Year (2021)	System Losses Applied in Tariff Proposal
1	0.00%	23.80
2	-0.85%	22.95
3	-1.95%	21.85
4	-2.80%	21.00
5	-3.80%	20.00

Source: 2022-2027 ECG Tariff Proposal

4.4.2.5 Distribution Service Charge (DSC 1)

ECG as part of its proposed DSC-1, ECG noted that even though tariff increases in the past have not kept pace with rising cost, the July 2019 approved DSC-1 was an unexpected reduction which altered historical trends significantly. This approved tariff (DSC 1) showed an average reduction of 14% on the previous DSC 1 approved and gazetted in March 2018. According to ECG, the combination of very low DSC-1 and recent critical investments (completed and ongoing projects) has further widened the gap in the DSC-1. The company therefore requested an approval of a cost reflective tariff to cover cost of operations.

Additionally, ECG indicated that the company's current DSC 1 (16.1094Ghp/KWh) which forms 23% of the current EUT is inadequate and below the distribution cost under the Cash Waterfall Mechanism. The company thus expects an increase in its DSC-1 considerably to a minimum of 30% of approved EUT during the 5-year period. This ECG noted would help improve revenue to meet the company's operational costs.

4.4.3 Key Policy Issues for Tariff Consideration

ECG proposed eight (8) key policy issues for consideration which are as follows:

4.4.3.1 Disaggregation of Distribution Service Charge (DSC)

As a policy, ECG proposed that, the Commission should disaggregate the Approved DSC by voltage levels to arrive at values for sub-transmission voltage (33kV), medium voltage (11kV) and low voltage levels. According to ECG with this policy, Bulk Customers can procure the services of DisCos to wheel their contracted energy to their offtake points.

4.4.3.2 Separation of Distribution Tariff from Retail Tariff

On the same DSC, ECG also recommended separation of the retail sales charge from the DSC for the 5-year regulatory period due to its importance in the near future. In addition, ECG proposed that such distribution tariff (Retail sales Charge) should be a cost reflective fixed cost for customers.

4.4.3.3 Cost of Service Pricing (Elimination of Cross-Subsidies)

Regarding cost of service pricing, ECG put forward the issue of eliminating cross-subsidies in the tariffs due to its implications. ECG indicated that allowing customers pay for their true cost of service had become necessary. The existing cross-subsidization, the company noted favours residential customers whose cost of service are higher compared with the Special Load Tariff (SLTs) customers. According to ECG, the Company is compelled to negotiate lower tariffs with some its SLT customers in order not to lose them. In view of above, ECG proposed complete elimination of cross-subsidies beginning with gradual decrease of the margins year by year during this 5-year tariff period.

4.4.3.4 Rate Structure

The Company raised concerns about the current PURC's Rate Structure. According to the Company, it faces difficulty in the implementing the prevailing residential and commercial tariff structure under prepayment metering. Additionally, the company has had to procure and customize prepayment meters which are expensive than normal prepaid meters. In light of above, ECG recommended the following rate structures for residential and commercial customers:

1. Two-band tariff for residential customers, the first band for lifeliners with tariff (exclusively applicable to customers with 0-50kWh consumption per month) and the second band will have tariff for all other residential customers.
2. For commercial customers, a well-defined threshold for low consumption customers such as tailoring shops, dress makers, barbers, etc. will form the first band with a lower tariff whilst all other customers will be in the second band or block with a higher tariff.

Implementation of the proposed two-block tariff according to ECG would reduce costs and help customers easily understand application of electricity tariffs.

4.4.3.5 Definition of Net Metering Tariff

With respect to net metering, ECG noted that the company faced the following challenges from implementation of the net metering scheme.

1. Energy for energy exchange mechanism.
2. The annual capacity threshold to enroll customers and capacity caps for various Renewable Energy (RE) technologies.
3. Absence of a contract framework to define the conditions for entry and exit, default and penalties and more importantly provision for customers who may game its implementation. The gaming may happen through continuous over-generation and export to the grid or customers who would not export power to the grid on a permanent basis.

In view of above, ECG has made proposals to the PURC on contracts and procedures for engaging customers for implementation of the net metering scheme.

4.4.3.6 Stranded Assets

As part of their proposal, ECG indicated that the company currently saddled with an issue of stranded assets, which is affecting the financial viability of the company. According to the Company, this has occasioned as customer exits from its distribution network because of the implementation of the WEM. To minimize the financial impact ECG noted that it has resolved to review the service application procedures with the object to make customers who exits the network make capital contribution to the stranded assets. ECG therefore requested the PURC to indicate clearly in its tariff

announcement and gazette, implications of customer exit to make customers aware of such regulatory provision.

4.4.3.7 Streetlight Tariffs

With regards to streetlights, ECG proposed to the Commission to introduce streetlight tariffs in their tariff structure. This according to the company will help account for the cost of streetlight consumption as the public light levy covers only about 30% of the actual cost of streetlight consumption.

4.4.3.8 Reserve Margin

With respect to reserve margin, ECG proposed that the cost of reserve margin be incorporated as part of ancillary services charge. In addition, the company put forward that a reserve margin of 18% capacity is appropriate to impact reliability of the system hence such cost needs to be considered in the Commission’s tariff determination.

4.4.4 Technical, Economic and Financial Assumptions

A number of key technical, economic and financial assumptions were identified by ECG as underlying their tariff proposal for the 2022-2027 Tariff Control Period. A summary of these assumptions is presented in Table 4-10 and Table 4-11.

Table 4-10 Summary of ECG’s Technical, Economic and Financial Assumptions

Item	Measure	Cost By Regulatory Year				
		2022	2023	2024	2025	2026
Power Purchases @ Bulk Supply Point	GWh	14,418	15,499	16,661	17,910	19,253
Power Sales	GWh	10,986	11,942	13,021	14,149	15,402
System Losses	%	23.80	22.95	21.85	21.00	20.00
Operation & Maintenance Expenses	MGHS	347.64	411.76	476.06	578.40	681.73
Administrative & General Expenses	MGHS	343.14	363.49	387.61	415.18	440.71
Human Resource Expenses	MGHS	976.29	1,122.74	1,122.74	1,235.01	1,235.01
Customer Service Expenses	MGHS	290.08	343.59	397.24	482.64	568.86
Depreciation	MGHS	1,196.85	1,560.13	1,894.82	2,264.02	2,979.85
Interest on Working Capital	MGHS	8.04	9.34	10.37	12.33	14.00
Interest on Foreign & Local Loans	MGHS	519.47	730.87	938.20	1,096.78	1,252.56
Return on RAB	MGHS	342.72	346.28	372.23	395.92	397.38
Corporate Tax	MGHS	41.02	72.00	127.97	162.23	176.17
Provision for Uncollectibles (2%)	MGHS	323.69	360.32	412.25	437.15	486.47
Total Revenue Requirement	MGHS	4,388.9	5,320.5	6,139.5	7,079.7	8,232.7

Source: 2022-2027 ECG Tariff Proposal

Table 4-11 Summary of ECG System Demand and Supply Data 2022-2027

Item Description	Measure	2022	2023	2024	2025	2026
Peak Demand	MW	2269	2382	2466	2506	2617
Supply Sources:						
Embedded Generation- Renewables						
(Solar & Biomass):						
BXC	GWh	29.90	29.90	29.90	29.90	29.90
Meinergy	GWh	23.53	23.53	23.53	23.53	23.53
Safisana	GWh	0.38	0.38	0.38	0.38	0.38
Total Renewables	GWh	53.81	53.81	53.81	53.81	53.81
Hydro Generation:						
Akosombo (VRA)	GWh	2,824	2,824	2,824	2,824	2,824
Kpong (VRA)	GWh	516	516	516	516	516
Bui	GWh	1,030	1,030	1,030	1,030	1,030
Total Hydro	GWh	4,371	4,371	4,371	4,371	4,371
Thermal Generation:						
VRA:						
TapCo (VRA) - NG	GWh	135	135	135	135	135
Ameri (VRA) - NG	GWh	983	983	983	983	983
IPPs:						
Amandi (NG)	GWh	1,752	1,752	1,752	1,752	1,752
Cenpower (NG)	GWh	2,847	2,847	2,847	2,847	2,847
Karpowership (NG)	GWh	1,714	2,841	3,863.16	3,863	3,863
Cenit (NG)	GWh	-	-	-	-	-
Sunon Asogli Power 1 (NG)	GWh	1,077	1,077	1,077	1,077	1,077
Sunon Asogli Power 2 (NG)	GWh	2,100	2,100	2,100	2,100	2,100
Early Power (NG)	GWh	-	-	190	1,493	2,893
AKSA Energy (HFO)	GWh	-	-	-	-	-
Total Thermal (VRA+IPPs)	GWh	10,607	11,734	12,946	14,249	15,649
Grand Total	GWh	15,032	16,159	17,371	18,674	20,074

Source: 2022-2027 ECG's Tariff Proposal

4.4.5 Revenue Enhancing and Reliability Improvement Strategies

According to ECG, a number of major investments were undertaken within the company's distribution system during 2017 – 2021 period. These investments totaling USD260.32 Million include construction and upgrade of Bulk Supply Points (BSPs), primary substations, switching stations, sub-transmission networks, specialised tools for life-line work voltage improvements, meters and service cables. These investments which were mainly undertaken in Greater Accra region, ECG noted are to ensure the availability of reliable and quality supply of power to customers.

Additionally, the company indicated other ongoing projects being undertaken in ECG operational regions including construction of primary substations and switching stations, sub-transmission and primary distribution lines, expansion of low voltage networks, among others. ECG stated that total investment cost for ongoing projects at the end of 2021 was USD274.42 Million whilst an amount of USD224.48 million will be incurred up to the completion of those projects.

With regards to revenue enhancing strategies, the company replaced a total of 533,908 and 319,817 faulty and obsolete meters in 2019 and 2020 respectively. A projected number of 289,848 meters were to be replaced in 2021 of which 151,878 meters were replaced in addition to timely service connections and prompt resolution of complaints.

To improve cash flows, the company indicated most post-paid meters within the urban and metropolitan areas are gradually being replaced with prepayment meters. ECG noted that as at December 2021, total active customer population was 4,290,148 made up of 2,002,967 post-paid

customers and 2,287,181 prepayment customers. The company further stated that it had deployed a number electronic payment platforms such as the ECG mobile application (ECG Power) which enable users with smart prepaid meter or post-paid meters to purchase credit and make bill payments at their convenience using a mobile devices and a web portal for online application of service connections. Other strategies include mobility application for remote readings for post-paid customers, monthly SMS alert for post-paid bills and electronic distribution of post-paid bills (especially for all high consuming customers).

According to ECG, a full-blown Meter Management System (MMS) as an ongoing project once deployed is expected to deliver a centralized End-to-End Meter Management System.

4.4.6 ECG Technical /Operating Performance Indicators

With regards to technical, operating and financial efficiency performance over the 2019-2020 tariff period and proposal for same over the Tariff Control Period, ECG submitted performance indicators presented in Table 4-12, Table 4-13 and Table 4-14.

Table 4-12 Summary of Existing and ECG Proposed Technical Performance Indices

Index	Measure	Category	2018	2019	2020	2021	Existing Benchmark	Proposed Benchmark
CAIDI	Hours	Metro	1.54	1.48	1.43	1.5	8	8
	Hours	Urban	1.24	1.32	1.63	1.89	12	12
	Hours	Rural	1.23	1.34	1.52	2	24	24
SAIFI	%	Metro	36.28	24.99	15.36	17.8	6	6
	%	Urban	72.99	47.06	26.45	27.69	6	6
	%	Rural	82.05	59.2	34.19	28.12	6	6
SAIDI	Hours	Metro	55.93	36.9	21.95	26.63	48	48
	Hours	Urban	90.53	61.99	42.92	52.43	72	72
	Hours	Rural	100.62	79.29	51.81	56.29	14	144

Source: 2022-2027 ECG's Tariff Proposal

Table 4-13 Summary of ECG's Financial Performance 2017-2021

Description	Measure	Period (Year)					CAGR
		2017	2018	2019	2020	2021	
Net Sales	MGHS	6,177	5,856	7,249	6,869	7,710	0.045
Power Purchase	MGHS	4,498	6,593	8,003	8,823	9,520	0.162
Transmission Cost	MGHS	555	387	206	904	1,014	0.128
Gross Profit	MGHS	397	(1,954)	(695)	2,972	674	0.112
Net Operating Profit	MGHS	(497)	(2,266)	(1,466)	181	(1,782)	0.291
ANFA	MGHS	15,131	17,465	19,651	20,461	22,568	0.083
ROR on ANFA (using profit)	%	(410.00)	(12.97)	(7.46)	0.88	(7.90)	0.140
Current Asset	MGHS	4,582	3,493	6,085	10	9,454	0.156
Current Liability	MGHS	7,159	8,503	12,500	16,431	18,808	0.213
Stock	MGHS	80.00	192.00	176.00	212.00	222.00	0.226
Current Ratio : 1	%	0.64	0.41	0.49	0.62	0.50	(0.05)
Gross Profit Profit Margin	%	6.38	(33.08)	(9.59)	43.27	8.74	0.063
Net Profit Margin	%	(8.05)	(38.70)	(20.22)	2.64	(23.11)	0.235

Source: 2022-2027 ECG's Tariff Proposal

Table 4-14 Summary of ECG Proposed Growth, Operational and Achievable Targets/Benchmarks

Indicator Type	Measure	Proposed Growth, Operational and Achievable Targets/Benchmarks
Revenue:		
Debt to Sales Ratio	%	20%
Revenue Increase	%	98%
Other Revenue Increases	%	10%
Operational Excellence:		
Technical (Reliability) Indicators		Achieve Benchmarks
System Loss	%	20%
Project Delivery	%	95%
Customer Value:		
Customer Connection (After Payment)	Days	5
Customer Service		Provide Value Added Services
Customer Satisfaction	%	70%

Source: 2022-2027 ECG’s Tariff Proposal

4.4.7 Concluding Remarks on ECG Submission

The preliminary review of ECG’s proposed distribution tariffs for the 2022-2027 Tariff Control Period highlights all the key issues for consideration by PURC in final determination of Distribution Service Charge for the company.

4.5 NORTHERN ELECTRICITY DISTRIBUTION COMPANY (NEDCo)

NEDCo's proposal covers adjustment in the Company's distribution service charge, rationale for level of tariff being proposed and underlying economic, technical and financial assumptions. Key findings from preliminary review of the proposal are presented in the following sections.

4.5.1 Proposed Distribution Service Charge

NEDCo's proposed Distribution Service Charge attributable to distribution network business (DSC-1) for 2022-2027 is presented in Table 4-15.

Table 4-15 Summary of Proposed NEDCo DSC for 2022-2027

Tariff	Measure	2021	2022	2023	2024	2025	2026	Average
Distribution Service Charge-1 (NEDCo)	GHp/kWh	47.1206	53.4937	66.8740	58.3455	58.7814	56.6161	56.8719

Source: 2022-2027 NEDCo's Tariff Proposal

A review of NEDCo's existing DSC-1 of GHp 16.1094/kWh with proposed 2022 DSC-1 of GHp 53.4937/kWh for 2021, indicates a **232.06%** upward adjustment in DSC. However, average for the tariff control period indicate **253.04%** upward adjustment in the DSC-1.

4.5.2 Rationale for Proposed Tariffs

The following reasons were put forward by NEDCo in support of the Company's request for upward review of its distribution service charge proposal presented in Table 4-15.

1. The sparse nature of habitation in many of rural communities within its operational territory coupled with its own annual expansion plan and Government of Ghana's on-going nationwide electrification programmes including those under SHEP, GEDAP. This the Company notes continues to worsen with each square kilometer increase of distribution network
2. Increasing depreciation of Ghana Cedi against the US Dollar
3. Increasing costs of vital materials and equipment relevant to provision of service
4. Uneconomic existing tariff
5. High Inflation of 19.4% as at March 2022
6. High proportion of Residential customers (approximately 84.96%), including about 46% lifeline customers in NEDCo's customer demography.
7. Need to inject capital to reduce system losses.

4.5.3 Key Policy Issue for Tariff Consideration

The following key policy issue was proposed by NEDCo for tariff consideration.

4.5.3.1 Hydro Allocation to NEDCo

According to NEDCo, increasing hydroelectricity proportion in its Bulk Generation Charge (BGC) will reduce cost of service delivery. NEDCo noted that when hydroelectricity was more in the BGC in 2016, NEDCo came close to making profit. In the light of above, NEDCo is off with a higher percentage of hydroelectricity in its energy mix and thus proposes that PURC through EMOP (Electricity Market Oversight Panel) allocate more hydropower to NEDCo in the energy mix during the tariff period. NEDCo therefore proposed allocation of 626GWh from hydro for the tariff period.

4.5.4 Technical, Economic and Financial Assumptions

NEDCo identified a number of key technical, economic and financial assumptions as underlying the company's proposed tariffs. A summary of these assumptions is presented in Table 4-16.

Table 4-16 Summary of NEDCo Technical, Economic and Financial Projections for 2022-2027

Item	Measure	Cost By Regulatory Year					
		2021	2022	2023	2024	2025	2026
Power Purchase	GWh	1,761	1,891	2,031	2,182	2,343	2,516
Power Sales	GWh	1,060	1,172	1,220	1,261	1,309	1,440
Operation & Maintenance Expenses	MGHS	101	109	117	124	132	143
Administrative & General Expenses	MGHS	56	59	63	68	72	76
Human Resource Expenses	MGHS	215	248	284	327	360	396
Depreciation	MGHS	64	146	276	134	128	127
Return on Average Net Fixed Assets	MGHS	64	66	76	83	78	73
Total Revenue Requirement	MGHS	500	627	816	736	769	815
Average Net Fixed Assets	MGHS	797	821	946	1,040	980	919
Return on ANFA	%	8	8	8	8	8	8

Source: 2022-2027 NEDCo's Tariff Proposal

4.5.5 Revenue Enhancing and Reliability Improvement Strategies

As part of NEDCo's revenue enhancing strategies, the company indicated that a number of projects had been undertaken to reduce commercial losses, improve revenue collection and improve customer service. These projects include installation of 25,000 single phase and 150 three (3) phase multi-part prepayment energy meters, Automatic Meter Reading (AMR) system for twenty (20) customers, Tee-off feeders (Boundaries) and Incomer feeders (Check meters) at primary Bulk Supply Points (BSP), construction of 70km Techiman-Abofour Line Construction, hexing system upgrade, installation of transformers, integrated billing and vending system and Installation of 100,000 Smart Prepaid Meters. These projects, NEDCo noted totaled GHS 63.92 Million and USD 18.45 Million.

With regards to planned projects, NEDCo proposed the following projects to be undertaken as and when funding becomes available. These projects include construction of Lamashegu primary substation, 100km Conductor upgrade, installation of smart meters, transformers, streetlights metering project, office complex among others. NEDCo further noted that failure to undertake these projects will result in load shedding, increase in technical losses, poor voltage profile, Poor supply reliability.

4.5.6 Proposed Technical and Commercial Performance

With respect to technical and commercial efficiency performance over the 2022-2027 Multi-Year Major Tariff Review Period, NEDCo submitted performance indicators presented in Table 4-17.

Table 4-17 Summary of NEDCo's Proposed Service Quality and Efficiency Targets for 2022-2027

Target	Measure	Period (Year)				
		2021	2022	2023	2024	2025
Collection Rate %	%	81.66	90	91	92	95
Receivable Lag	Days	980	750	600	550	350
Customer Satisfaction Index	%	72	85	86	87	88
% of network automated	%	10	20	30	40	50
Average IT System availability	%	97	98	99	99.5	99.8
Average System Availability Index	%	99.27	99.45	99.51	99.55	99.6
System Average Interruption Duration Index	Hours	63.6	48.2	43.3	39	35.1
System Availability Interruption Frequency Index	No.	40.9	39.5	30.3	25.3	20.7
Planned Maintenance Executed	%	95	96	97	98	98
Distribution Loss	%	27.29	26.09	24.89	23.69	22.49
34.5/11.5kV Primary Substations and 34.5kV Switching Stations Constructed	No.	0	1	0	0	8
Distribution Transformer Injected	No.	143	173	215	218	234
Available Transformer Capacity	MVA	2,049	2,137	2,165	2,202	2,221
HV /MV Line Upgrades/Extension	Km	317.3	681.7	605.4	605.5	605.5
Lv Line Upgrades/Extension	Km	91.1	164	148.4	168	164.4
Network Maintenance Undertaken	%	95	96	97	98	98

Source: 2022-2027 NEDCo's Tariff Proposal

4.5.7 Concluding Remarks on NEDCo's Submission

The preliminary review of NEDCo's proposed distribution tariffs for the 2022-2027 Tariff Control Period to a very large extent presents all the key issues for consideration by PURC in final determination of Distribution Service Charge for the company.

4.6 ENCLAVE POWER COMPANY (EPC)

Similar to NEDCo's tariff proposal, EPC's proposal covers adjustment in the Company's distribution service charge, rationale for level of tariff being proposed and underlying technical, economic and financial assumptions. Key findings from preliminary review of the proposal are presented in the following sections.

4.6.1 Proposed Distribution Service Charge (DSC)

EPC's proposed DSC for 2022-2027 is presented in Table 4-18.

Table 4-18 Summary of Proposed EPC DSC for 2022-2027

Tariff	Measure	2022	2023	2024	2025	2026	Average
Distribution Service Charge-1 (EPC)	GHP/kWh	40.8130	47.3857	39.2535	43.5081	41.0544	42.4029

Source: 2022-2027 EPC's Tariff Proposal

A review of EPC's existing DSC-1 of GHP 16.1094/kWh with proposed 2022 DSC-1 of GHP 40.8130/kWh, indicates an **153.3%** upward adjustment in DSC-1. However, average for the tariff control period indicate **163.2%** upward adjustment in the DSC-1.

4.6.2 Rationale Underpinning EPC's Tariff Submissions

EPC put forward the following reasons underlying the Company's proposed tariffs for 2022-2027 Tariff Control Period.

4.6.2.1 Full Cost Recovery

As part of the company's tariff proposal, EPC noted that its proposed tariff if approved by the Commission will enable the company fully recover its operational expenses and capital investments. The company further noted that it does not benefit from government subsidies or foreign and other grants.

4.6.2.2 Capital Investments

EPC indicated that the company has to undertake massive capital investments to support growing demand from its customers specifically from its greenfield site in Dawa. EPC noted that the company has to make further substantial investments in building a new distribution network infrastructure in Dawa and upgrading the existing network in Tema. According to EPC, previous investments have been funded with loans at full commercial interest rates and more commercial borrowing would be required for the new infrastructure.

4.6.2.3 Key Reliability Indices

According to EPC, the company recently signed a MOU with the Energy Commission to reduce 2019 key reliability indices by 10% based on 2019 datum and further commit to an annual 10% year-on-year improvement in these indices. The company stated that to achieve these key reliability indices, significant investments on its network and building of appropriate redundancy will be required. In view of above, the company requested approval of this tariff proposal to enable EPC meet these indices and improve on quality of service to consumers.

4.6.3 Key Policy Issues for Tariff Consideration

The following key issues were proposed by EPC for tariff consideration.

4.6.3.1 Hydro Allocation to EPC

In terms of hydro allocation, EPC request PURC to consider allocation of a portion of legacy hydro currently allocated for exports to its Tema Free Zones companies. According to the EPC, the Tema Free Zones companies are producing for export in Ghana. The Company stated there have been contention between EPC regulated and its de-regulated customers in terms of the rate charged. EPC therefore noted that the request would enable the company bridge the disparity between tariff for de-regulated and regulated customers. In addition, cost of power to these free Zone companies will encourage more export-oriented companies to set up in Ghana.

4.6.3.2 Electricity Prices for Industrial Customers

Prioritization of cheaper electricity generation resources for industries/businesses, instead of households proposed by EPC. EPC noted that price of electricity in Ghana has been a big disincentive for industrial companies seeking to site here in Ghana, with many choosing to locate in other countries where the cost of electricity to industries is lower, denying Ghana of much needed investment. In view of this, EPC pointed out that, allocation of the cheapest electricity generation resources to businesses will significantly lower the cost of doing business and drive expansion of businesses and job creation.

4.6.3.3 Transmission Service Charge Attributable to Losses

In their Proposal, EPC noted that, The Transmission Service Charge Attributable to Losses (TSC-2) introduced by PURC to be charged and payable to the Ghana Grid Company (GRIDCo) is being charged as part of the bill issued to them by the Volta river Authority. The Company there recommend that the anomaly is rectified in this current tariff review exercise and the gazette be made to reflect clearly who should invoice the TSC-2.

4.6.3.4 Private Sector Participation in Transmission Asset Ownership

Regarding Private Sector participation in Transmission asset ownership, EPC noted that, this has over the last few years, significantly increased and called for this to be encouraged (just as private sector participation in generation was encouraged) to free government of much needed financial resources in its quest to strengthen the NITS. This calls for a review of the structure of the Transmission Services Charge (TSC) to promote transparency on its build-up components (e.g. charge for capital investments – transmission lines vs. BSP switchgear and other equipment, operating and maintenance costs components of the TSC) so as to enable private investors recoup investments made.

4.6.4 Technical, Economic and Financial Assumptions

EPC identified a number of key technical, economic and financial assumptions underpinning the company's proposed distribution tariffs. A summary of these assumptions is presented in Table 4-19.

Table 4-19 Summary of EPC Technical, Economic & Financial Projections for 2022-2027

Item	Measure	Cost By Regulatory Year					2026
		2021 Actual	2022	2023	2024	2025	
Power Sales	GWh		308.42	308.42	385.53	400.56	500.70
Distribution Losses	MGHS	3.61	2.62	3.11	4.12	4.96	6.09
Operation & Maintenance Expenses	MGHS	0.23	3.76	4.08	4.42	4.77	5.16
Administrative & General Expenses	MGHS	12.13	29.81	36.95	45.83	56.88	70.73
Human Resource Expenses	MGHS	4.12	8.68	11.50	16.09	20.05	21.66
Depreciation	MGHS	16.13	16.03	17.05	18.10	22.39	25.67
Interest on Local Loans	MGHS	5.41	2.97	3.50	6.16	8.44	6.23
Return on Equity	MGHS	100.22	35.88	42.34	49.97	58.96	73.66
Interest on Working Capital	MGHS	(0.45)	3.54	3.72	3.27	2.78	2.45
VRA Contested Debt	MGHS	28.80	25.20	27.00	7.51	-	-
Total Revenue Requirement	MGHS	170.20	128.49	149.25	155.45	179.23	211.65

Source: 2022-2027 EPC's Tariff Proposal

4.6.5 Revenue Enhancing and Reliability Improvement Strategies

With regards to improving system reliability and quality of service to customers, EPC indicated that a number of initiatives have been undertaken to cover system reliability enhancement, system automation, loss control, capacity building and customer responsiveness. These projects include upgrade of feeder, load re-distribution on Feeder 72F4 acquisition of test equipment and specialized tools and completion of works on laboratory, Tema warehouse project to provide approximately 2,500 m2 space for storage of critical spares and equipment, deployment of mini-SCADA system and construction of 3-km double-circuit, 33 kV sub-transmission line in Tema enclave.

Additionally, roll-out of tele-metering to customers, Phase 1 of 34.5 kV distribution network within the Dawa Industrial Zone and construction of additional 161 kV line to supply the Tema enclave substation are ongoing projects the company is undertaking to enhance system reliability.

4.6.6 Proposed Technical and Commercial Performance

In terms of technical and commercial efficiency performance over the 2022-2027 Multi-Year Major Tariff Review Period, EPC submitted performance indicators presented in Table 4-20.

Table 4-20 Summary of EPC's Proposed Technical and Commercial Performance

Indicator	Measure	Target
Average Uptime per Feeder	%	> 99
Total System Distribution Loss (Commercial and Technical)	%	2.65
Response Time for Customer Complaints	Hours	Commercial - 24 Technical - 1
New Service Delivery for Existing Lines (Post Payment)	Days	5
New Service Delivery for New Lines (Post Payment)	Days	10
Customer-end Voltage Variation	%	<5
SAIDI	Hours/Customer	22.6
SAIFI	Outages/Customer	11.73

Source: 2022-2027 EPC's Tariff Proposal

4.6.7 Concluding Remarks on EPC's Submission

The preliminary review of EPC's proposed distribution tariffs for the 2022-2027 Tariff Control Period highlights all the key issues for consideration by PURC in final determination of Distribution Service Charge for the company.

CHAPTER 5 CONCLUSION AND RECOMMENDATION

5.1 Conclusion

We have provided in this report preliminary review and key findings from tariff proposal submissions by Regulated Public Utility Service Providers (USPs). This Regulated Utility Service Providers are Ghana Water Company Limited (GWCL), Ghana National Gas Company (GNGC), Volta River Authority (VRA), Ghana Grid Company Limited (GRIDCo), Electricity Company of Ghana Limited (ECG), Northern Electricity Distribution Company (NEDCo) and Enclave Power Company (EPC). Also a preliminary review of submissions by the Ghana National Petroleum Corporation (GNPC) was undertaken. The tariff proposals cover technical, commercial, quality of service as well as financial data in respect of the Water Value Chain, Natural Gas Value Chain and Electricity Value Chain for the Multi-Year Tariff Control period covering 2022-2027.

A key finding from the preliminary review relates to the adjustment being proposed by the Regulated Public Utilities noted above. In the case of Water, the GWCL proposed an increase from a Weighted Average Water Tariff of GHS6.7/m³ to GHS28.20/m³. With respect to Natural Gas Commodity Cost, the GNPC proposed an adjustment in its existing Weighted Average Gas Commodity Charge of USD 5.0140/MMBtu for TEN and Sankofa to USD 6.5206/MMBtu in 2022 for TEN, Sankofa and Tema LNG. In terms of Gas Gathering, Processing and Transmission, GNGC proposed an upward review in their tariffs from USD1.064/MMBtu in 2021 to USD2.159/MMBtu in 2022.

With respect to Electricity Generation, VRA proposed a 37.06% increase in its existing Composite Bulk Generation Tariff of GHP28.2273/kWh to GHP38.6879/kWh in 2021, whilst ECG provided details of tariffs by Independent Power Producer (IPP).

For Electricity Transmission, the Ghana Grid Company proposed an increase of 63.94% in its existing TSC-1 of GHP 5.4398/kWh to GHP 8.9131/kWh in 2022.

With regards to Electricity Distribution and Supply, whilst ECG proposed a 148% increase in existing DSC-1 of GHP 16.1094/kWh to DSC-1 of GHP 39.9513/kWh for 2022, NEDCo proposed existing 232.06% upward review in DSC-1 to GHP 53.4937/kWh for 2022. EPC on the other hand, proposed an upward adjustment of 153.35% in DSC-1 to GHP 40.8130/kWh for 2022.

5.2 Recommendation

In light of summary of key findings presented in this report, the following recommendation is made for further direction.

That, the Regulatory Economics Directorate (RED) carries out a comprehensive analysis of all the tariff proposals submitted to the Commission by Regulated Utility Service Providers and the GNPC in line with the Commission's Rate Setting Guidelines and present a draft report for discussion.

APPENDICES

Appendix-1 Summary of Proposed Percentage Adjustment in Existing Tariffs by Utility Service Providers

No.	Utility	Measure	Existing Tariff	Proposed 2022 Tariff	Percentage Change
1.	Ghana Water Company Limited:				
	Water Production		4.2114		
	Water Transmission Added Value		0.4672		
	Water Distribution Added Value		1.8176		
	Proposed Total Tariff/Percentage Increase	GHS/m3	6.4962	28.2000	334.10%
2.	Ghana National Petroleum Corporation:				
	Gas Production and Gathering				
	Gas Management Service				
	Proposed Total Tariff/Percentage Increase	USD/MMBtu	5.0410	7.9143	57.00%
3.	Ghana National Gas Company:				
	Gas Processing				
	Gas Transmission				
	Proposed Total Tariff/Percentage Increase	USD/MMBtu	1.0640	2.1153	98.80%
4.	Volta River Authority:				
	Weighted Bulk Generation Tariff	GHp/kWh	28.2273	38.6879	37.06%
5.	Ghana GRID Company:				
	Electricity Transmission Added Value Including Ancillary Services - TSC-1	GHp/kWh	5.4398	8.9181	63.94%
6.	Electricity Company of Ghana:				
	Electricity Distribution Added Value - DSC-1	GHp/kWh	16.1094	39.9513	148.00%
7.	Northern Electricity Distribution Company:				
	Electricity Distribution Added Value - DSC-1	GHp/kWh	16.1094	53.4937	232.06%
8.	Enclave Power Company:				
	Electricity Distribution Added Value - DSC-1	GHp/kWh	16.1094	40.8130	153.35%

Appendix-2 Compliance of Utility Service Providers to PURC Tariff Filing Templates and Requested Documentation

No.	Item Description	GWCL	GNPC	GNGC	VRA	GRIDCo	ECC	NEDCo	EPC
1	Water, Natural Gas, Electricity Production/Generation, Transmission, Distribution License approved by the Energy Commission/Water Resources Commission	√	√	√	√	√	√	√	√
2	Technical Proposal including Technical Characteristics of your Production/Generation, Transmission, Distribution Infrastructure	√	√	√	√	√	√	√	√
3	Financial Model Including detailed Investment Outlay as well as Operation and Maintenance Expenditure	√	√	√	√	√	√	√	√
4	Data on Critical Economic Parameters and Market Variables likely to impact your operations for the period under review (Assumptions)	√	√	√	√	√	√	√	√
5	Any other documentation/data relevant to the Commission's tariff review and approval by your company	√	√	√	√	√	√	√	√
6	A comprehensive write-up as per the Word Format contained in the Pendrive	√	√	√	√	√	√	√	√
7	Completed Excel Spreadsheets	√	√	√	√	√	√	√	√

Appendix-3 Summary of Outstanding Data to be Submitted by Utility Service Providers

No	Item Description	2022-2027 Tariff Filing	Remarks
1	GWCL	Filed	GWCL is fully compliant with PURC's tariff proposal submission requirements therefore no further submissions by the company is required.
2	GNPC	Filed	GNPC is fully compliant with PURC's tariff proposal submission requirements therefore no further submissions by the company is required.
3	GNGC	Filed	GNGC is fully compliant with PURC's tariff proposal submission requirements therefore no further submissions by the company is required.
4	VRA	Filed	VRA is fully compliant with PURC's tariff proposal submission requirements therefore no further submissions by the company is required.
5	GRIDCo	Filed	<p>GRIDCo is compliant with PURC's tariff proposal submission requirements, however, the company is requested formally the following:</p> <ul style="list-style-type: none"> • Projected Electricity Supply Plan from 2022-2027 • Breakdown of Projected Electricity to be transmitted Customer Category <ul style="list-style-type: none"> ✓ VALCO ✓ CEB (Contracted Supply) ✓ ECG ✓ Mines ✓ SONABEL ✓ NEDCo ✓ Manufacturing & Services & EPL ✓ Transmission Losses
6	ECG	Filed	<p>ECG is requested to submit the following:</p> <ul style="list-style-type: none"> • Data on System Demand and Supply for 2022-2023 • Further details on how the proposed tariffs for AMERI Power Plant and Legacy Hydro allocation were determined. • Data for 2022-2023 in respect of Portfolio PPAs assigned to PDS
7	NEDCo	Filed	NEDCo is fully compliant with PURC's tariff proposal submission requirements therefore no further submissions by the company is required.
8	EPC	Filed	EPC is fully compliant with PURC's tariff proposal submission requirements therefore no further submissions by the company is required.