

ORDER/NERC/207/2020

BEFORE THE NIGERIAN ELECTRICITY REGULATORY COMMISSION IN THE MATTER OF THE EXTRAORDINARY REVIEW OF MULTI YEAR TARIFF ORDER 2015 FOR PORT HARCOURT ELECTRICITY DISTRIBUTION PLC

TITLE

1. This regulatory instrument may be cited as MULTI YEAR TARIFF ORDER (MYTO) 2020 for Port Harcourt Electricity Distribution Plc.

COMMENCEMENT

2. This Order shall take effect from 1st September 2020 and shall cease to have effect on the issuance of a new Minor Review Order or an Extraordinary Tariff Review Order by the Nigerian Electricity Regulatory Commission ("NERC" or the "Commission").

CONTEXT

- 3. The Commission has reviewed an extra-ordinary tariff review application filed by Port Harcourt Electricity Distribution Plc ("PHED") seeking approval to review its end user tariffs taking into account the impact of inflation, foreign exchange and its investment plan towards improving service to customers.
- 4. The Commission, pursuant to sections 32 and 76 of the Electric Power Sector Reform Act ("EPSRA"), issued the MYTO 2015 Tariff Order in December 2015 to address, amongst other objectives, the provision of cost-reflective tariffs thus ensuring that prices charged by licensees are fair to consumers and are sufficient to allow licensees that operate efficiently to recover the full cost of their activities, including a reasonable return on the capital invested in the business.
- 5. Section 6 of the MYTO Methodology (Amended) provides for the biannual minor review of the tariffs taking into consideration changes in exogenous variables outside the control of operators in the Nigerian Electricity Supply Industry ("NESI"). These variables are the Nigerian and United States inflation rates, NGN/USD foreign exchange rates, gas prices and available generation capacity.
- 6. Section 9(c) of the "Regulations on Procedure for Electricity Tariff Reviews in the Nigerian Electricity Supply Industry" provides the basis upon which the Commission may accept applications for the conduct of extraordinary tariff reviews.
- 7. The Commission has reviewed the application filed by PHED taking into consideration the outcome of public consultations held in February March 2020 and approved end-user tariffs for the period 1st September 2020 to 30th June 2025. This Order reflects the impact

of changes in macroeconomic parameters on PHED's revenue requirement and a revised tariff design that aligns rates paid by customers with the quality of service as measured by average availability of power supply over a one-month period. This Order takes cognisance of the varying levels of infrastructural development of the utility's network that is directly attributable to the level of investment which results in customers enjoying different levels of supply in the same network and further seeks to incentivise utilities to invest across their entire networks thus ensuring that the rates paid by customers is aligned with service improvements.

- 8. PHED is hereby directed to continue engagement with their customers through all mediums of public consultations on guaranteed levels of quality of electricity supply on the basis of monthly average hours of supply per day.
- 9. Pursuant to the objective of incentivising a continuous improvement of service for all customers, there shall be no tariff reviews for customers experiencing an average power supply availability of less than 12-hours per day over a period of one month.
- 10. Unmetered customers within service bands A, B and C thus benefitting from a supply availability in excess of an average of 12hrs per day over a period of one month as affected by this tariff Order shall be protected by the provisions of "Order on the Capping of Estimated Bills in the NESI" and the FGN intervention on accelerated metering of all customers.
- 11. The Commission hereby orders that PHED shall continue to maintain the lifeline tariff of NGN4.00/kWhr for all customers consuming less than 50kWHrs of energy per month as a safeguard for the less privileged members of the society.

OBJECTIVES

12. This Order seeks to:

- a. Ensure that prices charged by PHED are fair to customers and are sufficient to allow PHED to fully recover the efficient cost of operation, including a reasonable return on the capital invested in the business pursuant to the provisions of Sections 32(d) and 76(2)(a) of EPSRA.
- Provide a path to a transition to fully service-based cost-reflective tariffs by July 2021.
- Reclassify and disaggregate customers and customer clusters on the basis of PHED's commitment on quality of service to customer clusters.
- d. Ensure that customer tariffs are commensurate and aligned with the quality and availability of power supply committed to customer clusters by PHED.
- e. Ensure sustained improvement in reliability and quality of supply by incentivising PHED to off-take energy in accordance with its Vesting Contract and MYTO load allocation.
- f. Provide a framework for settlement of imbalances between TCN and PHED on delivery and off-take of available energy in accordance with the Market Rules, Vesting Contracts and other industry documents.



- g. Provide a framework that ensures customer tariffs are consistent with the services they receive from PHED.
- h. Develop and implement a framework for enforcing market discipline in respect of market remittances and managing future revenue shortfalls in the industry including a minimum market remittance requirement to account for differences between costreflective tariffs and allowed tariffs in the settlement of invoices issued by the Nigerian Bulk Electricity Trading Plc ("NBET") and the Market Operator ("MO").
- i. Support the interim arrangements for payments to the electricity market and reaffirm the payment securitisation requirement and flow of funds from PHED to NBET and MO.

BASIS FOR THE REVIEW

13. Change in Rate Design

Pursuant to the outcome of the public hearings held in February/March 2020 on the extraordinary tariff application filed by PHED, the Commission directed the utility to adopt a revised rate design that aligns tariffs with service level experience of customers in different clusters/locations. Upon evaluation of PHED's application, the Commission considered and approved five (5) tariff 'Service Bands' representing relative quality of service experience as measured by the committed minimum average hours of supply per day over a period of one month, interruptions (frequency and duration), service voltage levels and a number of other service parameters. These service bands are further subdivided into tariff classes as follows:

- (i) Non-Maximum Demand (Non-MD).
- (ii) Low voltage Maximum Demand (MD 1).
- (iii) Medium/High voltage Maximum Demand (MD 2).
- (iv) Lifeline tariff class (R1) (for consumption of not more than 50kWh/month).

Table – 1 below is a comparative analysis of the new and old tariff classes:

Table - 1: PHED Tariff Classification

Service Bands	New Tariff Class	Old Tariff Class
Lifeline	R1	R1
	A - Non-MD	R2, C1, D1, A1 (single and three phase)
A minimum of 20hrs/day)	A - MD 1	R3, C2, D2, A2 Street Light
minimoni of zonrs/day)	A – MD 2	R4, C3, D3, A3
D	B - Non-MD	R2, C1, D1, A1 (single and three phase)
B	B - MD 1	R3, C2, D2, A2 Street Light
minimum of 16hrs/day)	B - MD 2	R4, C3, D3, A3
	C - Non-MD	R2, C1, D1, A1 (single and three phase)
minimum of 12hrs/day)	C - MD 1	R3, C2, D2, A2 Street Light
minimum of 12hrs/ddy)	C - MD 2	R4, C3, D3, A3
D	D - Non-MD	R2, C1, D1, A1 (single and three phase)
(minimum of 8hrs/day)	D - MD 1	R3, C2, D2, A2 Street Light
(minimum or onrs/day)	D - MD 2	R4, C3, D3, A3
F	E - Non-MD	R2, C1, D1, A1 (single and three phase)
E (minimum of 4hrs/day)	E - MD 1	R3, C2, D2, A2 Street Light
(illillillillillillillillillillillillill	E - MD 2	R4, C3, D3, A3



PHED shall be liable for service improvements in accordance with commitments under its universal service obligations for providing electricity supply to customers. Attached herewith as Appendix 2 are details of the service improvement commitments made by PHED to customers in various tariff bands for the period 1st September 2020 to 31st December 2021.

14. Capital Expenditure ("CAPEX") Plan

PHED has applied to the Commission for an upward review of the CAPEX provisions in its tariffs to support the implementation of its Performance Improvement Plans ("PIP") over the next 5 years. Pursuant to the request, the Commission has shared a CAPEX Request Template with PHED as a guide for a revised submission to qualify for consideration in the tariffs. Accordingly, the rates as contained in this Order and valid to December 31, 2020 are based on current CAPEX provision as contained in MYTO-2015 Order, with necessary adjustments for changes in relevant macroeconomic indices. Any verified and approved investments beyond the CAPEX allowances during this period shall be recognised and applied in the Tariff Order commencing on 1st January 2021. CAPEX review proposals for the period 2021 – 2025 shall be evaluated and upon approval applied in the Tariff Order commencing on 1st January 2021.

15. MYTO Load Allocation

The current MYTO load allocation to DisCos was presented as a subject matter for consultation during the public hearings in consideration of the applications for extraordinary tariff review. Several DisCos and the Transmission Company of Nigeria Plc ("TCN") consider the current MYTO Load Allocation as sub-optimal, given the changes that have occurred in load growth and capacities of the transmission and distribution networks. However, a full justification for a holistic review of the MYTO load allocation could not be established during this Extra-Ordinary Tariff Review process. Accordingly, the Commission orders that the current MYTO load allocation shall be maintained for the purpose of computing the relevant tariffs of all DisCos.

16. Tariff Assumptions

Pursuant to the provisions of the MYTO Methodology and the Regulation on Procedure for Electricity Tariff Review in NESI, Table 2 below provides the key indices considered in evaluating the tariff application by PHED in this Extraordinary Tariff Review process. The projected parameters in this Order shall be reviewed and retrospectively adjusted during the December 2020 Minor Review of Tariffs to align the assumptions with actuals.

- a. **Nigerian rate of inflation:** The Nigerian rate of inflation for July 2020 as obtained from the National Bureau of Statistics (NBS) was 12.82%. This rate was adopted to project Nigerian inflation rates for year 2020 and beyond.
- b. Exchange Rate: In accordance with the provisions of the MYTO Methodology, CBN official exchange rates were used in this review. The MYTO Methodology provides for a premium of 1% above the CBN rate as transaction cost and this was applied in the current review. The applicable NGN/USD exchange rate for the period



September 01, 2020 and beyond is computed as NGN380 $\pm 1\%$ premium = NGN383.80.

- c. US rate of inflation: Based on the data obtained from the website of the United States Bureau of Labor Statistics (http://www.bls.gov), the US inflation rate for the month of July 2020 was 1.0%. This rate was adopted for the purpose of this review to project US Inflation rates for year 2020 and beyond.
- d. Gas Price: The price of natural gas for the power sector has been regulated since the inception of MYTO in 2008. The Commission has maintained the gas price of US\$2.50/MMBTU and gas transportation cost of US\$0.80/MMBTU for this review. Other grid connected generation companies with contracted gas prices outside the regulated rates and as provided in their respective Gas Sale Agreements ("GSAs") are also provided for in the MYTO model as a pass-through cost.

Table - 2: Key Indices Considered in Evaluating PHED Application

Parameter	Sep - Dec 2020	Jan — Jun 2021	Jul – Dec 2021	Jan – Dec 2022
Nigerian Inflation	12.82%	12.82%	12.82%	12.82%
Exchange Rate (N/US\$)	383.8	383.8	383.8	383.8
US Inflation	1.00%	1.00%	1.00%	1.00%
Sent out Generation (MWh/h)	4,646	4,974	4,974	5,325
Weighted Generation Price (₦/kWh)	25.6	25.6	25.6	25.6
TCN and Admin Charge (₦/kWh)	7.8	8.3	8.3	8.2
Delivered to PHED (MWh/h)	260	280	280	301
ATC&C Losses	29.70%	23.76%	23.76%	23.76%
End-use Cost-reflective Tariffs (₦/kWh)	64.82	61.91	61.91	61.78
End-use Allowed Tariffs (₦/kWh)	50.05	50.05	61.91	61.78
Tariff Shortfall (N /kWh)	14.77	11.86	-	-



17. Approved End-user Tariffs Effective from 1st September 2020

Pursuant to PHED's application for extraordinary tariff review and consistent with paragraph 13 of this Order, the Commission considered and approved the tariffs in Table-3A below with effect from 1st September 2020 and shall remain in force until the issuance of a new Minor Review Order or an Extraordinary Tariff Review Order by the Commission.

Table - 3A: Approved End-user Tariffs (₩/kWh) for PHED

				, , ,			
Tariff Class	Sep - Dec 2020	Jan – Jun 2021	Jul – Dec 2021	Jan - Dec 2022	Jan - Dec 2023	Jan - Dec 2024	Jan - Dec 2025
Life-line (R1)	4.00	4.00	4.00	4.00	4.00	4.00	4.00
A - Non MD	55.20	55.20	68.23	68.09	68.00	66.36	64.86
A - MD1	54.80	54.80	67.78	67.64	67.55	65.92	64.43
A - MD2	52.20	52.20	64.55	64.42	64.33	62.78	61.36
B - Non MD	54.80	54.80	67.78	67.64	67.55	65.92	64.43
B - MD1	52.20	52.20	64.55	64.42	64.33	62.78	61.36
B - MD2	51.70	51.70	63.94	63.81	63.73	62.19	60.79
C - Non MD	51.70	51.70	63.94	63.81	63.73	62.19	60.79
C - MD1	49.20	49.20	60.90	60.77	60.69	59.23	57.89
C - MD2	49.20	49.20	60.90	60.77	60.69	59.23	57.89
D - Non MD	45.90	45.90	56.83	56.71	56.64	55.27	54.02
D - MD1	48.60	48.60	60.16	60.04	59.96	58.52	57.20
D - MD2	48.60	48.60	60.16	60.04	59.96	58.52	57.20
E - Non MD	43.60	43.60	53.96	53.85	53.78	52.48	51.30
E - MD1	47.60	47.60	58.92	58.80	58.73	57.31	56.02
E - MD2	47.60	47.60	58.92	58.80	58.73	57.31	56.02



18. Tariff Freeze for Customers in Bands D and E

Following consultations and directions on tariff policy, the Commission hereby approves a deferment of the applicable tariffs for customers in service bands D and E (that is customers with a service commitment of less than an average of 12-hours supply per day over a period of one month for the period 1^{st} September 2020 to 1^{st} January 2021. Accordingly, PHED shall continue to charge customers in Bands D & E the tariffs applied prior to this Order as provided in Table -3B below and shall only be allowed to charge the approved tariffs in this Order upon investments that improve quality of service experience thus migrating customers to higher service bands or another Order of the Commission.

Table – 3B: Applicable Tariffs for Customers in Bands D and E

Old Tariff Class	R1	R2	R3	R4	C1	C2	С3	D1	D2	D3	A1	A2	А3	S1
Rate (N/kWh)	4.00	30.23	48.39	50.76	38.96	46.72	48.39	41.81	46.72	48.39	40.60	45.58	49.07	40.62
New Category	Life- Line	Non- MD	MD-1	MD-2	MD-1									

19. Service Band Adjustment

Where there is a failure to deliver on committed service level by PHED over as evaluated over a period of 60 days, rates payable by all customers in the affected load cluster shall be retroactively adjusted in line with the quality of service delivered over the same period, upon verification by the Commission.

20. Minimum Remittance Threshold for September - December 2020:

The Power Sector Recovery Plan ("PSRP") provides for a gradual transition to cost-reflective tariffs with safeguards for the less privileged in the society. The Federal Government, under the PSRP Financing Plan, has committed to fund the revenue gap arising from the difference between cost reflective tariffs determined by the Commission and the actual end-user tariffs during the transition to cost-reflective tariffs. The waterfall of market revenues during the transitional period shall be -

- a. All DisCos are obligated to settle their market invoices in full as adjusted and netted off by applicable tariff shortfall approved by the Commission.
- b. In the determination of compliance with the minimum remittance threshold in this Order, the Commission shall consider verified receivables from MDAs for the settlement period and DisCo's historical collection efficiency for MDAs.
- c. All FGN intervention from the financing plan of the PSRP for funding tariff shortfall shall be applied through NBET and MO to ensure 100% settlement of market invoices as issued by Market Participants.



- d. Under this framework, the minimum market remittance threshold for PHED is determined after deducting the revenue deficit arising from tariff shortfall from the aggregate NBET and MO market invoices. PHED shall be availed the opportunity to earn its revenue requirement only upon fully meeting the following payment obligations:
 - i. Repayment of CBN-NEMS facility.
 - ii. 100% settlement of MO's invoice.
 - iii. Full settlement of 43.6% of NBET's monthly invoices being the minimum remittance threshold prescribed in this Order.
- e. PHED shall be liable to relevant penalties/sanctions for failure to meet the minimum remittance requirement in any payment cycle in accordance with the terms of its respective contracts with NBET, MO and the provisions of the Market Rules and Supplementary TEM Order.
- f. PHED shall maintain an adequate and unencumbered letter of credit covering three (3) months of the minimum payment obligations to NBET and MO in accordance with the provisions of the Market Rules and Market Participation Agreement.
- g. Where PHED is unable to comply with its minimum remittance threshold to the market prescribed in this Order from its operations as a utility, the company may seek external financing under the CBN intervention to cover the payment deficit but subject to the following conditions:
 - (i) A submission to the Commission providing details of the market remittance ramp up period, lenders term sheet, draw down period, moratorium (where applicable) and the repayment period of the loan.
 - (ii) The terms and conditions for the financing of the remittance shortfall shall be mutually agreed between PHED and the lenders and filed with the Commission.
 - (iii) The submission to the Commission, no later than two (2) weeks from the effective date of this Order, of the utility's financial model covering the remittance ramp up period and projections for the repayment of the external financing.

CAPACITY PAYMENT

- 21. The average tariff for PHED was determined considering the projected energy offtake of the company based on its percentage load allocation in the Vesting Contract. NBET shall continue to invoice PHED for capacity charge and energy based on its load allocation and metered energy respectively in accordance with the December 2019 Minor Review of MYTO-2015 and Minimum Remittance Order for Year-2020.
- 22. Where it is established that TCN is unable to deliver PHED's load allocation, TCN shall be liable to pay for the associated capacity charge. Where PHED fails to take its entire load allocation due to constraints in its own network, PHED shall be liable to pay the capacity charge as allocated in its Vesting contract. Table 4 provides the minimum market remittance threshold for PHED, with an effective date of 1st September 2020:



Table – 4: Minimum Remittance Threshold for September – December 2020

	PHED's Minimu	m Remittance	Table - September 2020 - December 2020
Head	Subhead	₩,000,000	Remarks
	NEMSF	1,001	CBN - Loan
	NBET Invoice	19,461	Projected Generation cost
Revenue Required	MO Invoice	5,898	Projected TCN and Admin Services cost
	PHED	8,245	Approved recovery of capital and operating expenses
	Total	34,605	Total Revenue Required
Allowed	Recovery	23,627	68% Being Amount recoverable through allowed end-use tariffs of PHED in 2020
Tariff	Shortfall	10,978	32% Being the difference between PHED's revenue requirement and its allowed recovery
	NEMSF	1,001	1st - Line Charge on Collection as per loan Agreement
	NBET Minimum Remittance	8,483	Being Minimum Remittance Obligation of 43.6% of NBET Monthly Invoices for September to December 2020. Full settlement to be supplemented by the FGN intervention funds.
Minimum Remittance	MO Minimum Remittance	5,898	Being Minimum Remittance Obligation of 100% of MO's monthly Invoices of September to December 2020.
Obligation	PHED	8,245	Being opportunity availed the DisCo to earn its revenue requirement based on its efficient operations and upon fu settlement of the minimum remittances to NEMSF, NBET an MO.
	Total Distribution	23,627	

EFFECTIVE DATE

23. This Order shall be effective from 1st September 2020.

Dated this 27th day of August 2020

James A. Momoh
Chairman

Dafe C. Alepeneye

Commissioner



Service Bands	New Tariff Class	Description
Lifeline	R1	Life-Line customers with energy consumption of not more than 50kWh/month
	A - Non-MD	Customers with single or three phase connection located within Band – A Service Level Feeders
(minimum of 20hrs/day)	A – MD 1	Customers with LV Maximum Demand connection located within Band – A Service Level Feeders
(minimon of Zonis/day)	A – MD 2	Customers with MV/HV Maximum Demand (11/33kV) connection located within Band – A Service Level Feeders
	B - Non-MD	Customers with single or three phase connection located within Band – B Service Level Feeders
B (minimum of 16hrs/day)	B – MD 1	Customers with LV Maximum Demand connection located within Band – B Service Level Feeders
(minimon or Toms/ day)	B – MD 2	Customers with MV/HV Maximum Demand (11/33kV) connection located within Band – B Service Level Feeders
	C - Non-MD	Customers with single or three phase connection located within Band – C Service Level Feeders
C (minimum of 12hrs/day)	C - MD 1	Customers with LV Maximum Demand connection located within Band – C Service Level Feeders
(minimoni or 12ms/ddy)	C - MD 2	Customers with MV/HV Maximum Demand (11/33kV) connection located within Band – C Service Level Feeders
	D - Non-MD	Customers with single or three phase connection located within Band – D Service Level Feeders
D (minimum of 8hrs/day)	D – MD 1	Customers with LV Maximum Demand connection located within Band – D Service Level Feeders
(minimum or onis/ddy)	D – MD 2	Customers with MV/HV Maximum Demand (11/33kV) connection located within Band – D Service Level Feeders
	E - Non-MD	Customers with single or three phase connection located within Band – E Service Level Feeders
E (minimum of 4hrs/day)	E-MD 1	Customers with LV Maximum Demand connection located within Band – E Service Level Feeders
(minimum of Ams/ddy)	E – MD 2	Customers with MV/HV Maximum Demand (11/33kV) connection located within Band – E Service Level Feeders



Appendix - 2: PHED's Service Level Commitments

BAND	NAMES OF 11KV FEEDER	Serv Minimum Duration of Supply	Average Frequency	i fo	of for Period-1 ge Average Duration of Interruption	Average Average Compared to the control of the cont	or Period-1: July - Dec 20: Average Average Continue to time to resolving to the property of	vice Minir tage Durati	vice Minir tage Durati	vice Minir	Service Level for Period-2: J Average Minimum Average Average Duration of Supply Of Interruptio
	NAMES OF 11KV FEEDER	Duration of Supply (Hrs/Day)	Frequency of Interruptio ns Per Day	ns Int	Duration of Interruptio ns Per Day	70	time to resolving complaints (Technical - Hours)	time to Service resolving Voltage complaints Level (Technical - Hours)	time to Service Duration of resolving Voltage Supply (Hrs/Day)	time to Service Duration of resolving Voltage complaints Level (Hrs/Day) Interruptio ns Per Day	time to Service Duration of resolving Voltage complaints Level (Hrs/Day) ns Per Day Hours) Frequency Duration of of Interruptio ns Per Day on the complaints (Hrs/Day) ns Per
Band A	AMIKA	20	2	2		24	24 5%		5%	5% 20	5% 20 2
Band A	CHAMPION BREWERIES	20	2	2		7		5%	5% 20	5% 20 2	5% 20 2 2
Band A	Band B HILLS	20	2	2		12		12	12 5%	12 5% 20	12 5% 20 2 - 5% 20 2
	EKPENUKPA	20	2	2		48	48	48	48 5%	48 5% 20	48 5% 20 2
1 mm	EPCL	20	2	2		13		13	13 5%	13 5% 20	13 5% 20 2
	EPZ1	20	2	2		7		7	7 5%	7 5% 20	7 5% 20 2
	FLOUR MILL	20	2	2		24	24 5%		5%	5% 20	5% 20 2
	INDUSTRIAL (Meter Solution)	20	2	2		6	6 5%		5%	5% 20	5% 20 2
4 6	TRANS AMADI	20	2	2		15		5%	5% 20	5% 20 2	5% 20 2 2
	UTC	20	2	2		12	12 5%		5%	5% 20	5% 20 2
	NNPC H/Estate Edr 1	20	2	2				20		2 1	2 1
Band A	NNPC H/Estate Fdr 1	20	2	2				20		2	2
Band A	EPZ	20	2	2				20	20 2		2
Band A	Iron & Steel	20	2	2				20	20 2		2
Band A	Trans Amadi Garden	20	2	2				20	20 2		2
Band A	Fisrt Aluminium	20	2	2				20	20 2		2
Band A	Rivoc Comp.	20	2	2				20	20 2		2
Band A	Air Liquid	20	2	2				20	20 2		2
Band A	Galba	20	2	2				20	20 2		2.
Band A	Stallium 1	20	2	2				20	20 2		2
Band A	Stallium 2	20	2	2				20	20 2		2
Band A	Shell I.A	20	2	2				20	20 2		2
Band A	Schlumberger	20	2	2				20	20 2		2
Band A	FIMIE	20	2	2		18			5%	5% 20	5% 20 2
Rand A	NDABROS	20	2	2		6	6 5%		5%	5% 20	5% 20 2

Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band A	Band A	Band A	Band A
RUMUOGBA	RUMUKALAGBO	RUMUIBEKWE	OLD ABA ROAD	GLASS FACTORY	AZUABIE	WATER BOARD	UNICEM	T1B	STATE HOUSING	SECRETARIAT	RUMUOLA	RUMUODUMAYA	RUMOLUMINI	RUKPOKWU	RSPUB-1	REFINERY LINE2	RAINBOW	OYIGBO	ORON ROAD	NTA	NIGER MILL	LE MERIDIAN	IKOT ABASI (Coconut)	IBESIOKPO	GREATER PH	FOUR LANE	EPZ2	EKIM (AKSU)	AKANI	AIRPORT	ABULOMA	Spar	Cummins	WATER WORKS	RIVOC
16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	20	20	20	20
ω	3	3	3	3	w	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	2	2	2	2
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
11	24	7	7	7	-	7	15	10	20	24	7	24	24	17	15	19	24	18	15	24	00	00	9	24	7	12	12	10	24	00	17			24	18
5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%			5%	5%
16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	20	20	20	20
ω	w	w	ω	w	w	w	w	w	w	3	ω	ω	ψ	3	3	w	w	3	ω	ω	ω	w	w	w	w	w	ω	ω	ω	3	w	2	2	2	2:
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9.35	20.40	5.95	5.95	5.95		5.95	12.75		17.00	20.40	5.95	20.40	20.40	14.45	12.75	16.15	20.40	15.30	12.75	20.40	6.80	6.80	7.65	20.40	5.95	10.20	10.20	8.50		6.80	14.45			20.40	15.30
5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%			5%	5%

Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B	Band B
MCC	Juanita	NPA	SHELL INDUSTRAIL	Aweto Guest Inn	UOE	Naval Base	WATER LINES	RUMUOMOI	OMERELU	NEW GRA	ELEKAHIA ESTATE	Liberation Stadium	Presidential Hotel	General Engineering	village2	village1	Uni-Uyo	Le- Meridian	GRA	4 POINT SHERATON	AIRPORT COMPLEX	Upth	Uniport	Airport	SHELTER AFRIQUE	OSONGAMA	NWANIBA	EWET	INDUSTRIAL	FEDERAL HOUSING	ESUKUTAN	Dangote	QUA RIVER	UNICAL	RUMUOROLU
16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
ω	3	3	3	3	3	3	3	S	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	w	w	3	3	3	3
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
20			15				17	00	00	24	10								18	7	15				11	17	18	11	24	15	24		17	00	7
5%			5%				5%	5%	5%	5%	5%								5%	5%	5%				5%	5%	5%	5%	5%	5%	5%		5%	5%	5%
16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16	16
ω	3	w	ω	3	ω	ω,	w	3	ω	w	ω	ω	ω	ω	S	ω	ω	ω	3	ω	ω	ω	ω	ω	ω	ω	ω	ω _.	w	ω	ω	ω	ω	ω	ω
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
17.00			12.75				14.45	6.80	6.80	20.40	8.50								18	5.95	12.75				9.35	14.45	15.30	9.35	20.40	12.75	20.40		14.45	6.80	5.95
55%			5%				5%	5%	5%	5%	5%								5%	5%	5%				5%	5%	5%	5%	5%	5%	5%		5%	5%	5%

Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band B	Band B	Band B	Band B	Band B
RUMUOKWUTA	NIGER CAT	AMADI AMA	Feg. Gov Coll	Onna 11KV	lkot Ikong	LOCATION	8 MILES	Army Barracks Elele	Emuoha	OKON	Village 11KV	Odaga 11KV	Ogbema 11KV	Market Rd 11KV	охивоко	OKURU	ODILI ROAD	Abonema	UST	UPTH	Band DBIRD	RSTV	REFINERY LINE 1	OPOLO	ONNA	EMUOHA	AMASOMA	AKAMKPA	AHOADA	ABONEMA	Crutech Calabar	Crutech Akamkpa	Water Board	ACB	Unicem
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	16	16	16	16	16
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3
3	3	3	3	3	3	3	3	3	3	w	w	w	w	w	ы	3	3	3	3	3	3	w	ω	₃	3	3	w	ω	3	w	2	2	2	2	2
24	9	17				24	2			18					2	24	24		18	10	17	12	18	18	18	12	6	7	80	10				12	
5%	5%	5%				5%	5%			5%					5%	5%	5%		5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%				5%	
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	16	16	16	16	16
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3
ω	w	ω	3	ω	3	ω	ω	3	3	S	3	ω	ω	ω	ω	ω	ω	ω	ω	ω	ω	₃	ω	ω	ω	ω	ω	ω	ω	w	2	2	2	2	2
23	9	16				23	2			17					2	23	23		17	10	16	11	17	17	17	11	6	7	00	10				10.20	
5%	5%	5%				5%	5%			5%					5%	5%	5%		5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%				5%	





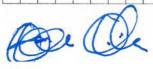
Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C	Band C
JETTY	Golf Estate	Abak 11KV	Ibagwa	Abak 10	Ukpum	YAHE	UGEP	TIMBER	ONNE	OKU IBOKU	MBO	KOM KOM	KATSINA ALA	ITAM JUNCTION	ISIOKPO	IMIRINGI	IKOT EKPENE	IGBO ETCHE	GOVT HOUSE	ETINAN	BOROKIRI	AGUDAMA	ABAK	RUMUEME	UST	Agip Comp.	4TH AVENUE Feeder 2	ESTATE	2ND AVENUE Feeder 1	AMADI SOUTH	Kidney Island	NPA	CHURCHILL	OGBATAI	NVUIGWE
00	80	00	00	00	00	00	00	00	00	00	8	00	00	00	8	8	00	80	8	00	00	8	00	12	12	12	12	12	12	12	12	12	12	12	12
4	4	5	5	5	u	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	3	3	3	3	3	3	3	3	3	3	3	w
16	24					24	18	15	11	16		17	11	13	13	15	7	9	7	24	10	48	•	15						18		18	10	17	20
6%	6%					6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	5%						5%		5%	5%	5%	5%
00	00	00	00	00	00	00	00	8	00	8	80	8	00	80	80	00	00	00	80	00	80	00	00	12	12	12	12	12	12	12	12	12	12	12	12
4.	4	5	5	G	U	4	4	4	4	4	4	4	4	4	4.	4	4	4	4	4	4	4.	4	4	4	4	4	4	4	.4	4	4	4	4	4
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	ω	ω	ω	3	w	ω	ω	w	3	3	w	ω
16	24					24	18	15	11	16	,	17	11	13	13	15	7	9	7	24	10	48		14						17		17	10	16	19
6%	6%					6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	5%						5%		5%	5%	5%	5%

Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D
Mbo 11KV	RAILWAY	AFAM ROAD	Kaiama 11KV	UKANA	TOWN FEEDER	UYO ROAD	NSASAK	IKPA ROAD	IDONGESIT NKANGA	IBB	EDEBOM	AKA ROAD	ESSIEN TOWN	Etinan 11KV	Etinan Fdr 2	Uyo Rd, Etinan Fdr 1	RCC	AFAHA UQUA	PORT HARCOURT ROAD	IKOT AKAN	IBEKWE	ETE URBAN	IKOT IBIOK	LEOPARD	ESSIEN 1	ПС	CHAIRMANS LODGE	TARGET	Band CIE	CRUTECH	CAMEROUN	ANANTIGHA	NDU	LOCAL GOVERNMENT	Odoni
8	8	00	8	8	00	8	00	00	8	8	8	00	80	80	00	8	00	80	8	80	00	8	8	8	80	80	8	8	8	8	8	8	8	8	8
5	4	4	5	4	4	4	4	4	4	4	4	4	4	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	U
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	20	15		20	7	24	20	24	24	24	24	24	18				18	18	17		12	24	15	17	10	12	7	15	7	24	24	20	19	9	
	6%	6%		6%	6%	6%	6%	6%	6%	6%	6%	6%	6%				6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	
00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	00	8	00	00	00	00	00	00	00	00
51	4	4	UI	4	4	4	4	4	4	4	4	4	4	u	u	уī	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	20	15		20	7	24	20	24	24	24	24	24	18				18	18	17	1	12	24	15	17	10	12	7	15	7	24	24	20	19	9	
	6%	6%		6%	6%	6%	6%	6%	6%	6%	6%	6%	6%				6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	





Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D
OBI WALI	SCHOOL OF NURSING	IWOFE	AKER Road	AGIP	ABACHA ROAD	SHELL ESTATE	SARS ROAD	PIPE LINE	OPM	MARKET ROAD	ADP	CIRCULAR ROAD	PALACE ROAD	AKPAJO	IGWURUTA	IGWURUTA	ELIMGBU	NKPOGU	ELEKAHIA VILLAGE	ZENITH	TAP	OLU OBASANJO	ELELENWO	BRISTOW	BROOKS	AKA ITIAM	REFINERY	PPMC	OGALI	EBUBU	Oku Iboku	OZUOBA	OHAKWE	BAKERY	MARY HARNEY
00	8	8	8	00	8	00	00	00	80	8	8	8	8	8	00	8	8	00	00	80	8	8	80	8	80	80	00	80	8	8	00	8	8	00	00
4	4	4	4	4	4	4	4	4	4	4	4	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	5	5	4	4	5	4	4	4	4
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
10	24	13	24	24	17	24	7	24	20	24	24		24	24	20	18	24	24	24	18	7	18	18	18	24	24			18	7		18	19	6	
6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%		6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%			6%	6%		6%	6%	6%	6%
00	00	00	00	00	00	00	00	00	00	00	00	00	80	00	00	00	00	00	00	80	00	00	00	00	00	00	8	00	00	00	00	00	80	00	00
4	4	4	4	4	4	4	4	4	4	4	4	u	4	4	4	4	4	4	4	4	4	4	4	4	4	4	u	5	4	4	UI.	4	4	4	4
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
10	24	13	24	24	17	24	7	24	20	24	24		24	24	20	18	24	24	24	18	7	18	18	18	24	24			18	7		18	19	6	
6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%		6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%			6%	6%		6%	6%	6%	6%



Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D	Band D
MARINE BASE	HAROLD WILSON	EASTERN BYPASS	OKRIKA	COT GAS	Bori	TUNGBO	OBOT OKARA	NDOKI	BUGUMA		IKOM TOWN	FOUR CORNER	irruan	Army Barracks Edor	Army Barracks Ogoja	Water Board	HABOUR ROAD	ABONNEMA WHARF	UST	OTOLO	RUMUEKINE	CHOBA	ALUU	SAGBAMA	OFONI	TRANS AMADI RESIDENTIAL	OWERRI RD	OLD DIOBU	MILE ONE	Idn	NSUKKA	IKWERRE ROAD	STATION ROAD	AMADI NORTH	OMACHI
4	4	4	4	4	4	4	4	4	4	4	8	00	80	00	80	00	8	8	8	8	8	8	80	8	00	8	8	8	8	80	00	80	8	80	00
5	5	5	5	5	5	5	5	5	5	5	4	4	5	5	5	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
2	2	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
8	12		18	17		6	17	10		24	12	19					18	24	7	10	24	18	24	24	10	7	18	12	18	24	10		18	10	24
6%	6%	6%	6%	6%		6%	6%	6%	6%	6%	6%	6%					6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
4	4	4	4	4	4	4	4	4	4	4	8	00	00	00	80	8	8	00	00	00	8	00	00	8	8	00	00	00	00	00	00	00	00	00	oc
5	5	ъ	Q	5	5	5	5	G	J.	5	4	4	5	5	ъ	5	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	.4	4	4	4
2	2	2	2	2	2	2	2	2	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
00	12	,	18	17		6	17	10		24	12	19					18	24	7	10	24	18	24	24	10	7	18	12	18	24	10		18	10	47
6%	6%	6%	6%	6%		6%	6%	6%	6%	6%	6%	6%					6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	070

Or g

Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E	Band E
NAVY	WOKOMA	EAGLE ISLAND	MBANO JUNCTION	FIRST BANK	BORI CAMP	BARRACKS	R-D ROAD	OKPORO ROAD	ОКОН	FGC	ELIOGBOLO	Odoro Ikot	Nkap	Ika	MGBUOBA	EGBELU	MARITIME	MBAK	IDORO ROAD	Alscon	WELLINGTON BASSEY	UDO-UDOMA	Buguma 11KV	Odoni	NEW ROAD
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
G	5	U	U	G.	u	U	5	U	U)	UI	U	UI	U	UI	5	5	u	5	5	G.	5	U	5	5	U
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12	5	7	24	24	18	10	24	7	17	00	•				9	10	7	18	18		-	1			15
6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%				6%	6%	6%	6%	6%		6%	6%			6%
4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
(J	U	U	5	5	5	_U	5	.5	₅	G.	5	Сī	₅	₅	ù	5	u	и	U	5	U	G,	u	5	5
2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12	G	7	24	24	18	10	24	7	17	00					9	10	7	18	18	1					15
6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%				6%	6%	6%	6%	6%		6%	6%			6%

