ORDER/NERC/277/2021

BEFORE THE NIGERIAN ELECTRICITY REGULATORY COMMISSION
IN THE MATTER OF THE EXTRAORDINARY REVIEW OF MULTI-YEAR TARIFF ORDER FOR KANO ELECTRICITY DISTRIBUTION PLC

### 1.1. Title

This regulatory instrument may be cited as NERC Order on Performance Improvement Plan (PIP) and Extraordinary Tariff Review Application for Kano Electricity Distribution Plc ("KEDCO").

### 1.2. Commencement

The approved PIP and Capital Expenditure ("CAPEX") programme of KEDCO shall take effect from 1st July 2021 and shall remain effective until 30th June 2026 unless amended by the Commission.

### 1.3. Context

KEDCO applied to the Commission in November 2019 for a review of the provisions for CAPEX in its Multi-Year Tariff Order ("MYTO") tariffs to support the implementation of its Performance Improvement Plan ("PIP") over the next 5 years. Under the Power Sector Recovery Program (PSRP), it is envisaged that the Commission would implement a robust tariff review process aimed at improving the performance of the Nigerian Electricity Supply Industry ("NESI"). This process involved a review of the capital expenditure allowances in the MYTO model to align with the Performance Improvement Plans (PIPs) of the Distribution Companies (DisCos). The approved PIP and Extraordinary Tariff Application shall form the basis for KEDCO to prioritise the implementation of the proposed CAPEX initiatives. The approved PIPs shall also form the basis for defining KPIs for KEDCO for the next 5 years by the Commission with emphasis on improvement in energy throughput and improved service delivery to the customers.

As part of the Stakeholder Consultation Process for Extra Ordinary Tariff Review, the Commission held public hearings to consider the applications filed by KEDCO in March 2020 and monitored the stakeholders' engagements by KEDCO at different locations within its franchise. Based on the feedback received during the consultations and subsequent

deliberations with various stakeholders, the Commission approved the Service-Based Tariff (SBT) effective from the 1st of September 2020 to ensure that rates paid by customers align with the quality of service as measured by the daily average availability of power supply over a 60-day reference period. Further updates to KEDCO's initial PIP submission have been considered as part of this review to align the PIPs with customer expectations of service commitment by KEDCO.

### 1.4. Summary and Overview of KEDCO's Network/Current State

KEDCO is one of the successor distribution companies ("DisCos") created following the unbundling and privatization of the state-owned Power Utility, the Power Holding Company of Nigeria Plc. The Company is responsible for distributing electricity within the areas of Kano, Katsina, and the Jigawa States of Nigeria. KEDCO covers a concession area of 67000 km2, supplying around 495,054 customers. The company in 2019 has an estimated energy demand of 160 GWh per month, with a constrained demand power of 380 MW. These restrictions are due to energy shortfall and transmission constraints.

KEDCO is supplied from 12 TCN transmission stations with a combined nameplate capacity of 1,042.50MVA. A total of 57Nos of 33kV feeders supply 68Nos of 33/11kV power transformers across 54 - injection substations. KEDCO has an installed capacity in substations of 705MVA for 33/11kV; 1,892MVA for 33/0.400kV; and 1,072MVA for 11/0.400kV. There are 3,599 11/0.400kV distribution transformers and 3,530 33/0.400kV distribution transformers served by KEDCO. The total transformational capacity of the 11/0.400kV and the 33/0.400kV distribution transformers are 1,072.23MVA and 1,892.56 MVA respectively. The route length for the 33kV and 11kVfeeders are 6,349.37km and 2,114.2km

Based on the demand forecast and network constraints analysis, KEDCO made a diagnostic of the current state of the network with the following results:

i. In 2019, 17% of the 11kV feeders of KEDCO's 115 feeders were constrained. In the absence of new investment, 36% of the 11kV feeders will be constrained by 2024.
ii. Also, In 2019, 36% of the 33kV feeders of KEDCO's 115 feeders were constrained. In the absence of new investment, 44% of the 33kV feeders will be constrained by 2024.
iii. Ageing infrastructure: This analysis reveals that KEDCO infrastructure is outdated or aging.
iv. Customer metering gap: As of September 2019, there are 119,309 metered customers in KEDCO, this figure represents 27% of total customers.
v. MDA Metering: current MDA metering is 54% covering Kano, Jigawa, and Katsina.

vi. IT gaps exist in the following applications:
   - Commercial Management System (CMS)
   - Incidents Recording and Management System (IRMS)
   - Enterprise Resource Planning (ERP)
   - Geographical Information System (GIS) mapping of customers and network assets: tool QGIS
   - Supervisory Control and Data Acquisition (SCADA) system

### 1.5. Stakeholder Consultation

KEDCO had followed a process for stakeholder consultation as directed by the Commission. Several focused group discussions to harness stakeholder's views on the service delivery, future expectations, and preferences were conducted with various customer groups such as the Premium Customers, Manufacturers Association of Nigeria (MAN), and Non-Maximum Demand customers. These engagements were required to:

- instill accountability between KEDCO and its customers on the services and justification for associated costs and resulting tariffs;
- assist in minimising disputes by engendering understanding and trust between KEDCO and its customers;
- provide an opportunity for KEDCO to engage with customers on the service improvement initiatives proposed in the PIP.

Key discussion areas for the stakeholder sessions were:

- Quality and reliability of supply
- Quality of the metering, billing, and payment process
- Consumers' perception of the processes
- Consumer relationship management and energy efficiency schemes
- Quality of fault complaint and repairs process

### 1.6. Outputs proposed with interventions:

KEDCO proposes to undertake numerous interventions to improve service delivery to the customers. Over the next five years, the proposed interventions will allow KEDCO to achieve but not limited to the following:

- Reduce ATC&C losses from the current level of 49.31% in 2019 to 17.21% in 2024
- Reduce the number of customer interruptions from the current level of 1,624 per month in 2019 to 50 per month in 2024
- Connect 140600 new customers in years 2020 to 2024;
- Market remittance of 100% over the planning horizon.

| Table – 1: Planned Service Improvements | | | | | |
|---|---|---|---|---|---|
| Item | Unit | Current | Service Improvement | Year-5 Target | Variance |
| Customers | # | 495,054 | 140,600 | 635,654 | 28.40% |
| ATC&C Loss | % | 49.31 | -32 | 17.2 | -65.10% |
| Energy Delivered | GWh | 1,920 | 2,640 | 4,560.0 | 137.50% |
| Average Duration of Supply | (Hrs/Day) | 12 | 9 | 21 | 75.77% |
| Average Frequency of Interruptions | #/day | 0.29 | -0.16 | 0.13 | -54.97% |
| Average Duration of Interruptions | Hrs/day | 4 | -2 | 2 | -55.49% |

### 1.7. Investment Strategies:

Key strategies proposed by KEDCO to attain the targeted service levels over the next 5 years include the following:

1. Implementation of investments and other initiatives in distribution network rehabilitation and upgrade aimed at resolving existing constraints limiting availability and quality of energy supply.
2. Identification of eventual constraints to meeting electricity demand arising from issues affecting high and medium voltage network infrastructure.
3. TCN-DisCo interface projects are required in resolving existing constraints and meeting electricity demand.
4. Installation of metering systems to capture all electrical parameters involved in commercial transactions with NBET and TCN and amounts of energy injected into the network operated by the DisCo.
5. Incorporation of an Incidents Recording and Management System (IRMS) to identify the location and analyze the extent of an interruption in electricity supply and to enable fast resolution and service restoration.
6. Regularization of consumers not registered as customers.
7. Installation of appropriate meters for all the ministries, departments, and agencies at federal, state, and local levels.
8. Incorporation of a Commercial Management System (CMS) to manage all commercial processes: revenue cycle, attending to customers, etc.
9. Incorporation of an Enterprise Resource Planning (ERP) information system to support corporate planning and management of shared services (accounting, finance, human resources, procurement, logistics & information technology).

10. Implementation of a Revenue Protection Project (RPP) supported by Advanced Metering Infrastructure (AMI) to systematically record and monitor consumption of large and medium customers.
11. Incorporation of a Supervisory Control and Data Acquisition System (SCADA) to operate and control HV & MV infrastructure.

| Table – 4: Proposed Investment (Technical) | | | | | | | |
|---|---|---|---|---|---|---|---|
| Item | Unit | Current | Additions/ Construction | Year-5 Target | Variance | PIP Rehabilitation | % of Rehabilitation |
| Network Length 33 kV | Km | 6,349 | 105 | 6,454 | 2% | 265 | 4% |
| Network Length 11 kV | Km | 2,114 | 196 | 2,310 | 9% | 250 | 12% |
| Network Length 0.4 kV | Km | 11,300 | 630 | 11,930 | 6% | | |
| MVA distributions transformers | MVA | 2,093 | 56 | 2,149 | 3% | | |
| # distributions transformers | # | 7,129 | 315 | 7,444 | 4% | | |
| MVA Substations transformers | MVA | 737 | 23 | 760 | 3% | | |
| # Substations transformers | # | 76 | 2 | 78 | 3% | | |

| Kano Disco Proposed Investment Programme | | | | | | |
|---|---|---|---|---|---|---|
| Investment Plan | 2021 | 2022 | 2023 | 2024 | 2025 | Total |
| | N000,000 | N000,000 | N000,000 | N000,000 | N000,000 | N000,000 |
| Construction of 33kV Feeder | 1,518 | 1,518 | 1,518 | 1,518 | 1,518 | 7,591 |
| Rehabilitation of 33kV Feeder | 1,924 | 1,924 | 1,924 | 1,924 | 1,924 | 9,618 |
| Construction of 11kV Feeder | 787 | 787 | 787 | 787 | 787 | 3,935 |
| Rehabilitation of 11kV Feeder | 533 | 533 | 533 | 533 | 533 | 2,663 |
| Construction of 0.415kV Feeder | 1,089 | 1,089 | 1,089 | 1,089 | 1,089 | 5,445 |
| Distribution Plan Capex | 1,168 | 1,168 | 1,168 | 1,168 | 1,168 | 5,842 |
| Substation Plan Capex | 294 | 294 | 294 | 294 | 294 | 1,471 |
| ATC&C Loss Reduction Plan (total) | 906 | 906 | 906 | 906 | 906 | 4,531 |
| Customer Service Improvement Plan | 572 | 572 | 572 | 572 | 572 | 2,862 |
| IT Investments (SCADA+GIS+ERP+HSE) | 620 | 620 | 620 | 620 | 620 | 3,100 |
| Network Metering Capex | 612 | 612 | 612 | 612 | 612 | 3,060 |
| Others | 238 | 238 | 238 | 238 | 238 | 1,192 |
| | - | - | - | - | - | - |
| Total CAPEX | 10,262 | 10,262 | 10,262 | 10,262 | 10,262 | 51,310 |

## 2.0 Commission's Review

2.1. The Commission's Guideline for PIP Application established the criteria for KEDCO to prepare an output-based plan that sets out the service improvement output targets over the planning horizon of 5 years. This plan includes the programs and activities that will lead to the realisation of those outputs, the human and material resources required, the projected costs and analysis of the risk factors, and the proposed mitigation measures. KEDCO's PIP and Extraordinary tariff review application was exposed to a Public Hearing and consultation presided over by a panel of three commissioners in line with the Business Rules of the Commission and the "Regulations on Procedure for Electricity Tariff Reviews in the Nigerian Electricity Supply Industry" in February 2020. The Hearing provided an avenue for customers, interested parties, and expert intervenors to critically examine KEDCO's proposal and the associated expected improvement in service levels. KEDCO was further directed to conduct stakeholders' (customers') engagements at various locations within its franchise area which were attended to and monitored by the staff of the Commission.

2.2. Following the outcome of the public consultation, the Commission via Order NERC/198/2020 required KEDCO to update its PIP and Extraordinary Tariff Review Application by disaggregating its respective service areas and/or customers per quality of service in order to align rates payable by customers with the quality of supply ("service-based tariffs"). A further review of KEDCO's updated submission was considered using the following criteria:

i. completeness and consistency of the description of each component of the PIP;
ii. compliance of each component with the Guidelines for preparation of PIPs issued by the Commission;
iii. analysis of expected results/outcomes from the implementation of each component including the mitigants provided for addressing identified challenges that may hinder the achievement of target;
iv. thorough price benchmarking and other relevant approaches to the estimation of resources (physical amounts and related OpEx and CapEx) for each component;
v. determining if the cost and timeline for delivering the output is efficient;
vi. assessing the efficiency of the proposed financing arrangement;
vii. analysing the level of technology/modernization leap proposed going forward;
viii. determining and analysing the overall level of efficiency improvement proposed.

## 3.0 Results of the Review

The Commission, having considered KEDCO's PIP and Extraordinary Tariff Review Application in line with the provision of EPSRA and relevant regulations, approved the PIP

and CAPEX programme over 5 years as provided in Table – 4 and Table – 5 below. Summary of approved projects for Year-1 and Year-2 are also provided in Table – 6, while a detailed list of approved projects for Year-1 and Year-2 are provided in Appendices 1 and 2 respectively.

Table – 4: KEDCO's Approved 5-year CAPEX Programme

| Year | 2021 | 2022 | 2023 | 2024 | 2025 | Total |
|---|---|---|---|---|---|---|
| | Period - 1 | Period - 2 | Period - 3 | Period - 4 | Period - 5 | Period 1 – 5 |
| | ₦000,000 | ₦000,000 | ₦000,000 | ₦000,000 | ₦000,000 | ₦000,000 |
| Annual Approved CAPEX | **12,611.9** | **12,611.9** | **12,611.9** | **12,611.9** | **12,611.9** | **63,059.4** |

Table – 5: KEDCO's Approved 5-year PIP and CAPEX Programme

| 5-Year Approved PIP | |
|---|---|
| | *₦000,000* |
| Total CAPEX | **63,059.4** |
| Distribution Network Capex | **33,688.4** |
| Construction of 33kV Feeder | 10,666.0 |
| Rehabilitation of 33kV Feeder | 2,831.3 |
| Construction of 11kV Feeder | 4,476.8 |
| Rehabilitation of 11kV Feeder | 1,528.5 |
| Construction of 0.400kV Feeder | 3,671.0 |
| Distributions transformers (plan) | 4,604.8 |
| MVA Substations transformers (plan) | 5,910.0 |
| ATC&C Loss Reduction Plan (total) | **7,314.9** |
| Customer Service Improvement Plan | **3,750.0** |
| IT Investments (SCADA+GIS+ERP+HSE) | **7,145.4** |
| SCADA Initiatives | 2,867.7 |
| GIS Improvement | - |
| ERP System Infrastructure | 1,654.2 |
| HSE Initiatives | 524.1 |
| AMI Network Metering | 2,099.4 |
| Customer Metering Capex | - |
| Network Metering Capex | **5,380.1** |
| Others | **5,780.6** |

Table – 6: KEDCO's Approved PIP and CAPEX Programme for 2021 and 2022

| Approved PIP | 2021 | 2022 |
|---|---|---|
| | *N000,000* | *N000,000* |
| Total CAPEX | 12,611.9 | 12,611.9 |
| **Distribution Network Capex** | **4,124.8** | **9,350.5** |
| Construction of 33kV Feeder | 737.2 | 3,529.2 |
| Rehabilitation of 33kV Feeder | 744.6 | 387.9 |
| Construction of 11kV Feeder | 120.7 | 1,670.1 |
| Rehabilitation of 11kV Feeder | 503.3 | 108.1 |
| Construction of 0.400kV Feeder | - | 1,468.4 |
| Distributions transformers (plan) | 1,419.6 | 422.3 |
| MVA Substations transformers (plan) | 599.5 | 1,764.5 |
| **ATC&C Loss Reduction Plan (total)** | **2,926.0** | - |
| **Customer Service Improvement Plan** | **1,500.0** | - |
| **IT Investments (SCADA+GIS+ERP+HSE)** | **2,296.0** | **562.1** |
| SCADA Initiatives | 733.4 | 413.7 |
| GIS Improvement | 0.0 | 0.0 |
| ERP System Infrastructure | 661.7 | 0.0 |
| HSE Initiatives | 209.6 | 0.0 |
| AMI Network Metering | 691.4 | 148.4 |
| Customer Metering Capex | - | - |
| Network Metering Capex | **235.2** | **1,916.9** |
| Others | **1,529.9** | **782.4** |

## 4.0 Annual Update of PIPs

KEDCO shall be required to provide an annual update to the PIP to reflect the proposed investment programme as part of the Minor Review of Tariffs on a continuous basis. The Commission recognizes this PIP as a dynamic roadmap of where KEDCO envisions to be in the next five (5) years and will continue to evolve in alignment with market development and changes to the operating environment. KEDCO may invest more than the indicated annual CAPEX figure in any particular year on account of front-loading proposed future investments or due to the unanticipated critical investment needs subject to the approval of the Commission.

## 5.0 Front-loading of CAPEX

KEDCO is at liberty to front-load its CAPEX programmes to attain accelerated service improvements. Front-loading of CAPEX programme in any year shall not exceed annual CAPEX for the following year in line with the framework for continuous update of the PIPs.

## 6.0 CAPEX Clawback

Annual CAPEX provisions that are unutilized or imprudently expended shall be clawed back during Minor Reviews of Tariffs in line with the requirements of Section 7(a) of Regulations on Procedure for Electricity Tariff Reviews in the NESI.

## 7.0 Commencement and Effectiveness

The approved PIP and CAPEX programme of KEDCO shall take effect on the 1st day of July 2021 and shall remain effective until the 30th day of June 2026.

## 8.0 Signature

Dated this 29th day of April 2021

Sanusi Garba

Chairman

Dafe C. Akpeneye

Commissioner

# Appendices

| *Distribution Network: lines* | | | | | | |
|---|---|---|---|---|---|---|
| *Project Type: Construction of 33kV Feeder* | | | | | | |
| # | Project Description | | Location | Route Length (km) | Project Completion Date (MM - YY) | Expected Impact in MW) |
| 1 | Proposed Construction of 3No. 33KV feeders ex-Gagarawa 2x30/40/60MVA, 132/33KV Transmission Station, Kano | | Gagarawa, Jigawa | 3.2 | 07 _ 21 | 12 |
| 2 | Proposed Construction of 4No. 33KV feeders ex-Rimin Zakara 2x60MVA, 132/33KV Transmission Station, Kano | | Rimin Zakara, Kano | 22 | 07 _ 21 | 40 |
| 3 | Ajiwa 33KV, Bifurcation | | Katsina | 3.2 | 08 _ 21 | 2.9 |
| 4 | Kafin Hausa, Breaker for LILO | | Kafin Hausa, Jigawa | 0.12 | 09 _ 21 | 2 |
| 5 | Proposed Dutsen-Ma 33KV | | Kannkia, Katsina | 7 | 09 _ 21 | 2.3 |
| 6 | NNPC - DC to Jogana& Mariri | | Eastern bypass, Kano | 3.85 | 10 _ 21 | 2 |

| *Distribution Network: lines* | | | | | | |
|---|---|---|---|---|---|---|
| *Project Type: Rehabilitation of 33kV Feeder* | | | | | | |
| # | Project Description | Type of Rhabilitation | Location | Route Length (km) | Project Completion Date (MM - YY) | Expected Impact in MW) |
| 1 | Challawa 33KV | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | Challawa, Kano | 2.4 | 07 _ 21 | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 2 | Dr. Jamil 33KV | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | Zaria, road | 4.0 | 07 _ 21 | 6 |
| 3 | Tamburawa 33KV | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | Tamburawa, Kano | 3.2 | 07 _ 21 | 2.2 |
| 4 | Sharada/Dangote | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | Sharada, Industrial Esate, Kano | 8.0 | 08 _ 21 | 3 |
| 5 | Angel | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | Sharada, Industrial Esate, Kano | 3.2 | 08 _ 21 | 2.4 |
| 6 | Coca Cola | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | Challawa Industrial Estate, Kano | 3.2 | 08 _ 21 | 4 |
| 7 | Dutse 33KV | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | Dutse, Jigawa | 4.0 | 08 _ 21 | 2.8 |
| 8 | IDH | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | Kano | 4.8 | 09 _ 21 | 2.1 |
| 9 | CBN | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | Kano | 12.0 | 09 _ 21 | 4 |
| 10 | Kurna | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | Kano | 16.0 | 09 _ 21 | 1 |
| 11 | Kofar Guga 33KV | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | Katsina | 2.8 | 10 _ 21 | 4 |
| 12 | BUK | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | Kano | 6.4 | 10 _ 21 | 2 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 13 | R/Zaki | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | Kano | 4.8 | 11 _ 21 | 5 |

| *Distribution Network: lines* | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Project Type: Construction of 11kV Feeder* | | | | | | | |
| # | Project Description | Overhead/ underground | Conductor Size (mm2) | Location | Route Length (km) | Project Completion Date (MM - YY) | Expected Impact in MW) |
| 1 | Proposed NEW 11KV FEEDER | Overhead | 150mm2 | Farm Center, Kano | 8.25 | 10 _ 21 | 4 |

| *Distribution Network: lines* | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Project Type: Rehabilitation of 11kV Feeder* | | | | | | | |
| # | Project Description | Type of Rhabilitation | Conductor Size (mm2) | Location | Route Length (km) | Project Completion Date (MM - YY) | Expected Impact in MW) |
| 1 | Industrial 11KV | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 150 mm2 | Funtua, Katsina | 1.6 | 06_ 21 | 2 |
| 2 | Masarauta 11KV | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 150 mm2 | Kano | 4.95 | 07 _ 21 | 2 |
| 3 | Yusuf Road | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 150 mm2 | Kano | 6.05 | 07 _ 21 | 2.8 |
| 4 | Maje 11KV | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 150 mm2 | Kano | 2.2 | 08 _ 21 | 2 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 5 | Sani Mainagge 11KV | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 150 mm2 | Kano | 5 | 08 _ 21 | 2.5 |
| 6 | Gwammaja | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 150 mm2 | Kano | 2.8 | 08 _ 21 | 1.4 |
| 7 | Sabon Gari 11KV | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 150 mm2 | Kano | 4 | 08 _ 21 | 2.6 |

| *Distribution Network: stations* | | | | | |
|---|---|---|---|---|---|
| *Project Type: New Construction, Reinforcement and Standardisation of Distrubution Sub-station* | | | | | |
| # | Transformation Voltage (kV) | Rating - kVA | Type of work (New Construction or Replacement) | Quantity | Expected Impact in MW |
| 1 | 11/0.400 | 500KVA | New Construction/Replaement | 60 | 22.5 |
| 2 | 33/0.400 | 500KVA | New Construction/Replaement | 20 | 7.5 |
| 3 | 11/0.400 | 300KVA, | New Construction/Replaement | 60 | 12 |
| 4 | 33/0.400 | 300KVA, | New Construction/Replaement | 20 | 4.5 |
| 5 | 11/0.400 | 50KVA | New Construction | 70 | 5 |

| *Network: Standardisation of Existing Injection Substations (33/11kV)* | | | | |
|---|---|---|---|---|
| *Project Type: Replacement of Switch Gears, Control Panel and Protection Equipment* | | | | |
| # | Description | Quantity | Project Completion Date (MM - YY) | Expected Impact |
| 1 | Tripping Unit & Battery Charger | 10 | 12 _ 21 | Improve,services,reliability and safety |
| 2 | Transformer Control Panel | 5 | 12 _ 21 | Improve,services,reliability and safety |

| | | | | |
|---|---|---|---|---|
| 3 | Line Control Panel | 5 | 12 _ 21 | Improve,services,reliability and safety |
| 4 | 11KV breaker panels (7-board panels) ( 2 I/C, 1 B/C and 4 O/g) | 2 | 12 _ 21 | Improve,services,reliability and safety |
| 5 | 33KV outdoor Breaker SF6 , With transformer control panel. | 5 | 12 _ 21 | Improve,services,reliability and safety |
| 6 | Microprocessor based self powered R.M.U | 10 | 12 _ 21 | Improve,services,reliability and safety |

*ATC&C Loss Reduction Plan*

| # | Name | Description | Quantity | Project Completion Date (MM - YY) | Expected Impact |
|---|---|---|---|---|---|
| 1 | Upgrade of MD metering (HV) | OLD | 25 | Aug-21 | Expected increase in 10% of monthly billing of the customers (N30m) |
| 2 | Upgrade of MD metering(LV) | OLD | 37 | Aug-21 | Expected increase of 25% of the customers monthly billing (N8m) |
| 3 | New MD Metering/Upgrade | OLD | 4270 | Dec-21 | Expected increase in total MD customer billing by 15% ( N320m) |
| 4 | Prepaid meter relocation | OLD | 2700 | Oct-21 | Expected increase in customer vending. |
| 5 | DT Metering | NEW | 2647 | Dec-21 | Expected increase in billing efficiency to 95% and Collection efficiency to 85% on each metered DT. |
| 6 | Working Tools | NEW | 104 | Jun-21 | It will improve on the billing efficiency and any possible meter bypass and revenue protection. |
| 7 | Procurement of prepaid meter seals | NEW | 100000 | Jun-21 | Securing of all prepaid meters against possible bypass and tampering. |

*Customer Service Improvement Plan*

| # | Name | Description |
|---|---|---|

| | | |
|---|---|---|
| 1 | Commercial Management System | Meter Information System |
| 2 | Commercial Management System | Billing |
| 3 | Commercial Management System | Service Management |
| 4 | Commercial Management System | Payment System |
| 5 | Commercial Management System | CRM |
| 6 | Commercial Management System | Meter Management System |
| 7 | Commercial Management System | Energy Sales and Audit |
| 8 | Commercial Management System | Software Implementation & Training |
| 9 | Commercial Management System | |
| 10 | Commercial Management System | |
| 11 | Commercial Management System | |
| 12 | Commercial Management System | |
| 13 | Commercial Management System | |
| 14 | Commercial Management System | |
| 15 | Commercial Management System | |
| 16 | Commercial Management System | |
| 17 | Commercial Management System | |
| 18 | Commercial Management System | |
| 19 | Commercial Management System | |
| 20 | Commercial Management System | |
| 21 | Commercial Management System | |
| 22 | Commercial Management System | |
| 23 | Commercial Management System | |
| 24 | Commercial Management System | |

| IT Investments (SCADA) | | | | |
|---|---|---|---|---|
| # | Name | Description | Project Completion Date (MM - YY) | Expected Impact |

| | | | | |
|---|---|---|---|---|
| 1 | SCADA | General Control and Management | 10_21 | SCADA system would enable the company to have real-time control on power flow and load dispatch. This would enable us to adhere to the SBT regime and also provide data on non-compliances for corrective measures. The data would also provide valuable inputs for system losses and provide critical inputs for controlling commercial losses due to theft and unauthorized abstraction of energy, thus providing significant controls to lower ATC&C losses. |
| 2 | | Substation Automation | 09_21 | |
| 3 | | Transmission Management System | | |
| 4 | | Distribution Management System | | |
| 5 | | Outage Management System | | |
| 6 | | Distributed Resource Management System | | |
| 7 | | Human Machine Interface And Data Logging | 08_21 | |
| 8 | | Engineering and Support Services Including Design, Simulation,Programming,Communication, Training and Maintenance Support | 02_22 | |

| IT Investments (ERP) | | | | |
|---|---|---|---|---|
| # | Name | Description | Project Completion Date (MM - YY) | Expected Impact |
| 1 | ICT Working Tools | HP AIO Desktop PC | 06_21 | Provision of ICT equipment to staff for operational purposes. These equipment would be allocated to staff to ensure that all KEDCo staff have the right working tools to deliver on their KPIs. KEDCO plans to purchase the systems to support staff to key into the automation drive of the company. The systems would also allow them to be able to securely access the AMI, ERP, CMS, IRMS and other management and operational support systems |
| 2 | | HP LaserJet Pro m477dw | 06_21 | |
| 3 | | 1200VA UPS | 06_21 | |
| 4 | | Dell Latitude Laptop | 06_21 | |
| 5 | | HP Pavillion Laptop | 06_21 | |
| 6 | Data Center & Communicatio n Infrastructure | Wide Area Network | 07_21 | Improved Operational efficiency<br>Enhanced Communication capabilities<br>Reliable and fast connectivity KEDCo-wide<br>Access to shared resources |
| 7 | | Local Area Network- (Regional Offices & Billig Centers) | 08_21 | |

| | | | | |
|---|---|---|---|---|
| 8 | | Radio Communication System (Dispatch & Operations) | _09_21 | |
| 9 | | Tier 3 Data Center | 11_21 | |

| IT Investments (HSE) | | | |
|---|---|---|---|
| # | Name | Project Completion Date (MM - YY) | Expected Impact |
| 1 | PPE Coveralls | Jun-21 | To meet statuary requirement of providing all the necassary PPE to all staff in order to prevent accidents. |
| 2 | Helmet | Jul-21 | To reduce the impact of fall or falling object that may cause harm, and also to meet regulatory requirement |
| 3 | Jogger Safety Boots | Jun-21 | To meet statuary requirement of providing all the necassary PPE to all staff in order to prevent accidents. |
| 4 | 1000nos. Safety belt | May-21 | To prevent fall from height, and to meet regulatory requirement. |
| 5 | 2000nos. Safety Googles | Jul-21 | To prevent the effect of arc flash. |
| 6 | 150nos. Bee Jacket | May-21 | To prevent bee stings for maintenance operation on poles with bees |
| 7 | 2500nos Reflective Jackets | Jul-21 | Ease visibility and identification for sales representatives and officers on special assignment |
| 8 | Manequine | Jul-21 | Promote understanding of first aid training (CPR) for staff in the event of an emergency. |
| 9 | First Aid Kit | Jun-21 | Providing first aid treatment for staff and to meet regulatory standard. |
| 10 | Digital Camera | Jun-21 | To facilitate accident investigation and HSE inspections. |
| 11 | Portable defibrillator | Jul-21 | To preserve and save life in the event of an emergency. |

| IT Investments (AMI) |
|---|

| # | Name | Description | Project Completion Date (MM - YY) | Expected Impact |
|---|---|---|---|---|
| 1 | AMR | Software Module | 06_21 | Precise load control<br>Consumer profiling and load pattern analysis<br>Time based pricing<br>Improved quality of supply<br>Load forecasting and load management<br>Reducing and managing the peak load<br>Reducing the overall cost of energy purchased<br>Better customer service<br>Outage management. |
| 2 | | Communication Module | 07_21 | |
| 3 | | SIM Cards | 08_21 | |
| 4 | | Engineering and Support Services, Design, Programming, Communication, Training and Maintenance Support | 08_21 | |

| Network Metering (Smart Meters) | | | | | |
|---|---|---|---|---|---|
| # | Project Description | Description | Quantity | Project Completion Date (MM - YY) | Expected Impact |
| 1 | EDMI Grid Meters | New | 150 | Sep-21 | Energy Accountability |
| 2 | 33kv Feeder Meters(Outdoor VT & CT) | New | 4 | Sep-21 | Energy Accountability |
| 3 | Provision for Feeder Meter Replacement | old | 20 | Sep-21 | Energy Accountability |

| *Other Service Improvement Plan* | | |
|---|---|---|
| # | Name | Project Completion Date (MM - YY) |
| 1 | Insulation Tester 500v-10kv Digital Display. | 10_21 |

| | | |
|---|---|---|
| 2 | Digital Earth Resistance Tester 20-200-2000Ω | 10_21 |
| 3 | Digital Clamp On Multimeter.0-1000A Ac,750v Ac. | 10_21 |
| 4 | Digital Voltmeter 0-36kv Range,110V, AC | 10_21 |
| 5 | Digital Ammeter 0-1200A AC | 10_21 |
| 6 | HT Line Tester 0-40kv | 10_21 |
| 7 | Oil Dielectric Tester 0-60kv | 10_21 |
| 8 | Phase Sequence | 10_21 |
| 9 | Tripping Unit Charger 110-130v Dc, 60A | 10_21 |
| 10 | Vacuum Interrupter Tester.10, 14, 25, 40,60kv Switchable. | 10_21 |
| 11 | Load Locker ammeter | 10_21 |
| 12 | Power System Analyser | 10_21 |
| 13 | Harmonics Analyser | 10_21 |
| 14 | Programmable VHFmobile Radio | 10_21 |
| 15 | Programmable VHF Based Radio | 10_21 |
| 16 | Programmable HF Based Radio | 10_21 |
| 17 | Pull Lift 1& 1/2 tonnes | 10_21 |
| 18 | Grounding Stick | 10_21 |
| 19 | Typho Jack ( come along) 3/4 tonne | 10_21 |
| 20 | Operating Rod | 10_21 |
| 21 | Crimping Machine 500mm2 | 10_21 |
| 22 | Roller Bearing Block | 10_21 |
| 23 | Oil pumping Machine | 10_21 |
| 24 | Cable fault detector | 10_21 |
| 25 | Single binoculars 15 X 17 with high quality | 10_21 |
| 26 | Tool Boxes | 10_21 |
| 27 | HT Ladders | 10_21 |
| 28 | LT Ladders | 10_21 |
| 29 | Grass cutter | 10_21 |
| 30 | Potable thermal detector | 10_21 |
| 31 | Repair of Power Transformers | 10_21 |

| | | |
|---|---|---|
| 32 | Transformer Workshop Equipment | 10_21 |
| 33 | Distribution Transformers Fencing | 10_21 |
| 34 | 150mm2 x1 Core Cable | 10_21 |
| 35 | Termination Kit | 10_21 |
| 36 | Transformer oil | 10_21 |
| 37 | 25No. Golf Wagon | 08_21 |
| 38 | 30No. Hilux | 08_21 |
| 39 | 20No. Trycycles | 08_21 |
| 40 | 50No. Motor Cycles | 08_21 |
| 41 | 3No. IVECO, 10 tonne (front & back) | 08_21 |
| 42 | 5No. IVECO, 8tonne (front & Back) | 08_21 |
| 43 | 1No. IVECO, 30 Tonne (front & Back) | 08_21 |
| 44 | Contingency Provision | |

*Appendix 2 - Details of Planned 2022 Investments for Kano Electricity Distribution Company*

| *Distribution Network: lines* | | | | |
|---|---|---|---|---|
| *Project Type: Construction of 33kV Feeder* | | | | |
| # | Project Description | Route Length (km) | Project Completion Date (MM - YY) | Expected Impact in MW) |
| 1 | Construction of 33KV line from K/Dangora/Tamburawa TS to Kura industrial estate | 45 | May-22 | 15 |
| 2 | Construction of 33KV line from Bichi TS to Kwa, Dawakin Tofa, Kano | 35 | Mar-22 | 34 |

| | | | | |
|---|---|---|---|---|
| 3 | Costruction of 33KV line from Walalambe TS to Gezawa commodities market | 55 | Feb-22 | 2 |
| 4 | Construction of 33KV line from Walambe TS to proposed 2x15MVA, 33/11KV sub-station at Walalambe, western by pass, Kano | 10 | Feb-22 | 24 |
| 5 | Construction of 33KV line for installation of 250No. Distribution transformers across all the regions | 250 | Feb-22 | |
| 6 | Constrution of turn-in turn-out at Naibawa injection substation on Bagauda 33KV feeder | 19 | Jun-22 | 6 |

| *Distribution Network: lines* | | | | |
|---|---|---|---|---|
| *Project Type: Rehabilitation of 33kV Feeder* | | | | |
| # | Project Description | Type of Rhabilitation | Route Length (km) | Project Completion Date (MM - YY) |
| 1 | 33KV SPANISH 1 | Replacement of conductors, cross-arms, insulators, etc. | 7.38 | May-22 |
| 2 | 33KV SPANISH 2 | Replacement of conductors, cross-arms, insulators, etc. | 7.38 | Apr-22 |
| 3 | 33KV ZARIA ROAD | Replacement of conductors, cross-arms, insulators, etc. | 7.99 | May-22 |
| 4 | 33KV BATA | Replacement of conductors, cross-arms, insulators, etc. | 5.23 | Apr-22 |
| 5 | 33KV ATM | Replacement of conductors, cross-arms, insulators, etc. | 1.84 | Apr-22 |
| 6 | 33KV CLUB | Replacement of conductors, cross-arms, insulators, etc. | 3.69 | May-22 |
| 7 | 33KV FLOUR MILLS | Replacement of conductors, cross-arms, insulators, etc. | 14.14 | May-22 |
| 8 | 33KV MTN | Replacement of conductors, cross-arms, insulators, etc. | 15.37 | May-22 |

| | | | | |
|---|---|---|---|---|
| 9 | 33KV GASKIYA | Replacement of conductors, cross-arms, insulators, etc. | 5.53 | Jun-22 |
| 10 | 33KV NNPC | Replacement of conductors, cross-arms, insulators, etc. | 31.97 | Jun-22 |
| 11 | 33KV TEXTILES | Replacement of conductors, cross-arms, insulators, etc. | 14.14 | Jun-22 |

| *Distribution Network: lines* | | | | |
|---|---|---|---|---|
| *Project Type: Construction of 11kV Feeder* | | | | |
| # | Project Description | Route Length (km) | Project Completion Date (MM - YY) | Expected Impact in MW) |
| 1 | Construction of 4No. New 11KV feeders from Walambe Inj. Stn & Dawanu Inj. Stn each. Total 8 Feeders to provide supply to new areas . | 96 | May-22 | 60 |
| 2 | Construction of 2No. New 11KV feeders from existing injections substations to relieve the existing feeders. 1 no. from Radio House and 1 no. from Sarada Inj. Staion | 13 | Jun-22 | 80 |
| 3 | Construction of 11KV lines for installation of 100No. Distribution transformers | 100 | Apr-22 | |

| *Distribution Network: lines* | | | |
|---|---|---|---|
| *Project Type: Rehabilitation of 11kV Feeder* | | | |
| # | Project Description | Type of Rhabilitation | Route Length (km) |
| 1 | 11KV DALA FOODS | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 0.825 |

| | | | |
|---|---|---|---|
| 2 | 11KV CERAMIC | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 2.2 |
| 3 | 11KV N.B.C. | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 2.75 |
| 4 | 11KV BOMPAI | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 2.75 |
| 5 | 11KV INDEPENDENCE | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 7.15 |
| 6 | 11KV FUNTUA WATER WORKS | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 1.65 |
| 7 | 11KV GOVERNMENT HOUSE DUTSE | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 1.65 |
| 8 | 11KV TSAMIYA BABBA | Replacement of broken poles, X-arms, weak jumper ,Interpoling etc | 14.85 |

| *Distribution Network: lines* | | | |
|---|---|---|---|
| *Project Type: Construction and Rehabilitation of 0.400kV Feeder* | | | |
| # | Project Description | Type of Project | Location |
| 1 | Installation of Distribution Transformers at various locations across all the regions<br>11/0.400 Kv, 500kVA - 70 Nos<br>33/0.400kV, 500kVA - 30 Nos | Construction | Across Kano, Katsina & Jigawa |
| 2 | Conversion of LV distribution to HVDS and installation of 200No. 50KVA, 11/0.400KV transformers on Race course, Tarauni, Audu Bako and Dr. Bala 11KV feeders. | Construction | Kano |

| *Distribution Network: stations* | | | | | |
|---|---|---|---|---|---|
| *Project Type: New Construction, Reinforcement and Standardisation of Distrubution Sub-station* | | | | | |
| # | Name of Substation | Transformation Voltage (kV) | Rating - kVA | Type of work (New Construction or Replacement) | Quantity |
| 1 | 500KVA,11/0.400KV Transformer | 11/0.400 | 500 | To maintain mandatory spares inventory for reliability improvement. | 50 |
| 2 | 300KVA,11/0.400KV Transformer | 11/0.400 | 300 | To maintain mandatory spares inventory for reliability improvement. | 30 |

| | | | | | |
|---|---|---|---|---|---|
| 3 | 50KVA,11/0.400KV Transformer | 11/0.400 | 50 | To maintain mandatory spares inventory for reliability improvement. | 50 |

| *Network: Injection Substations (33/11kV)* | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Project Type: Construction, Reinforcement and Standardisation of Injection Sub-station* | | | | | | | |
| # | Name of Substation | Location | N° of units | Type (Manned/unmanned) | Rating - MVA | Project Completion Date (MM - YY) | Expected Impact (MW) |
| 1 | Construction of 2x15MVA, 33/11KV sub-station at Walalambe, western by pass, Kano | Kano | 1 | Manned | 30 | May-23 | 24 |
| 2 | Construction of 2x15MVA, 33/11KV sub-station at Dawanau, Kano | Kano | 1 | Manned | 30 | May-23 | 24 |

| *Network: Standardisation of Existing Injection Substations (33/11kV)* | | |
|---|---|---|
| *Project Type: Replacement of Switch Gears, Control Panel and Protection Equipment* | | |
| # | Name of Substation | Quantity |
| 1 | Tripping Unit & Battery Charger | 10 |
| 2 | Transformer Control Panel | 15 |
| 3 | Line Control Panel | 5 |
| 4 | 11KV breaker panels (7-board panels) ( 2 I/C, 1 B/C and 4 O/g) | 8 |
| 5 | 33KV outdoor Breaker SF6 , With transformer control panel. | 10 |
| 6 | Microprocessor based self powered R.M.U | 10 |

| IT Investments (AMI) | | |
|---|---|---|
| # | Name | Description |

| | | |
|---|---|---|
| 1 | AMR Expansion | 1 |

| Network Metering (Smart Meters) | | |
|---|---|---|
| # | Project Description | Quantity |
| 1 | DT Metering | 2500 |

| *Other Service Improvement Plan* | | |
|---|---|---|
| # | Name | Description/Qty |
| 1 | HT Ladders | 100 |
| 2 | LT Ladders | 100 |
| 3 | Grass cutter | 5 |
| 4 | 150mm2 Aluminium Conductor | 1300 |
| 5 | 150mm2 x1 core XLPE 11KV Cable | 15000 |
| 6 | 150mm2 x1 core XLPE 33KV Cable | 20000 |
| 7 | Programmable VHFmobile Radio | 35 |
| 8 | Programmable VHF Based Radio | 28 |
| 9 | Programmable HF Based Radio | 25 |
| 10 | Pressure Testing Kit | 12 |
| 11 | Oil Dielectric Tester 0-60kv | 2 |
| 12 | Vacuum Interrupter Tester.10, 14, 25, 40,60kv Switchable. | 5 |
| 13 | Power System Analyser | 3 |