



Terms of Reference

1. Background

The Kenya Power and Lighting Company, under the Distribution Master Plan, intends to carry out expansion works on its medium voltage electricity transmission and distribution network involving upgrades of existing substations; Construction of new substations; and construction of new lines in its three larger administrative regions of: Western Kenya/Nyanza, Coast and North/Central Rift. The objective of the projects is to reduce technical losses and improve quality of supply, thereby coping with additional demand. It is envisaged that this will increase access to electricity in line with vision 2030. In addition, it will also provide alternative electricity supply paths in order to increase reliability of power supply.

2. Objective(s) of the Assignment

The objective of the assignment is to provide implementation support to KPLC in the implementation component of the Distribution Master Plan. The consultant is expected to provide technical support related to supervision of works implementation for the various contract lots.

3. Scope of Services, Tasks (Components) and Expected Deliverables

SCOPE OF WORKS CONTRACTS

The scope of work includes Design, Supply, Installation and Commissioning of New /Upgrade of Substations and Lines in Coast, West Kenya/Nyanza and North/Central Rift regions. This shall be packaged into Seven (7) contracts as follows

Scope of Works			
Lot	Upgrade Works	New Works	Summary
Central/North Rift Lot 1 Transmission line	<ul style="list-style-type: none"> 2 No. 132 KV lines take-off bays at Narok 132/33 Kv substation and 132kv busbar extension 	<ul style="list-style-type: none"> 25 Kms of 132kv double circuit transmission line from Narok towards Bomet 	<ul style="list-style-type: none"> 2x132kv bays at Narok 25 km of 132kv line 132kv busbar extension
Central/North Rift Lot 2 Transmission line	Nil	<ul style="list-style-type: none"> 35Kms of 132kv double circuit transmission line along Narok – Bomet proposed 132kv double circuit line 	<ul style="list-style-type: none"> 35Kms of 132kv double circuit transmission line
Central/North Rift Lot 3 Transmission line	<ul style="list-style-type: none"> 2 No. 132 KV lines receiving bays at Bomet 132/33 Kv substation, 132kv busbar extension at 132kv/33kv Bomet Substation and 25km of 132kv line 	<ul style="list-style-type: none"> 25Kms of 132kv double circuit transmission line from Bomet towards Narok 	<ul style="list-style-type: none"> 2x132kv bays at Bomet 25 km of 132kv line 132kv busbar extension
Coast Region Lot 4 Transmission Lines & Substation	<ul style="list-style-type: none"> Modifying existing lines routes to create space for Monopoles 132kv line Extension of double 132kv busbars at Kipevu Hill Top substation and create a new bay. 	<ul style="list-style-type: none"> 6.5Kms 132 Kv single circuit transmission line on self supporting monopoles / and a portion of 0.2km of 132Kv underground cables Establish a new 2X45MVA, 132/33KV substation, with incoming 132KV line bay , GIS indoor substation with 10 No 33KV feed-out bays and 0.8km of marine cable. 	<ul style="list-style-type: none"> 6.5 km 132kv circuit line 132kv bays at Mbaraki and Kipevu 33KV indoor GIS substation with feed-outs Busbar extension at Kipevu 132kv substation 2x45mva 132/33kv substation 10 No. 33kv feeder outs
Coast Region Lot 1 Distribution substations and lines	<ul style="list-style-type: none"> 1 No. 33 KV incoming line to Mtongwe, Kwale, Shimoni and Port Reitz 	<ul style="list-style-type: none"> Mtongwe 7.5 MVA 33/11 KV Substation with associated control room and 6 Kms of outgoing 11KV lines and 3km of 33kv incomer. Shimoni 7.5 MVA 33/11 KV Substation with associated control room and 0.5 Kms of outgoing 11KV lines and 15km of 33kv incomer. Kwale 7.5 MVA 33/11 KV Substation with associated control room and 5 Kms of outgoing 11KV lines and 0.2 km of 33kv incomer. Port Reitz 7.5 MVA, 33/11 KV Substation with associated control room and 2 Kms of 	<ul style="list-style-type: none"> 4x7.5 MVA 33/11kv s/s 13.5 Km of 11kv 22.2 Km of 33kv 4X Substation Control Rooms

		outgoing 11KV lines and 4 Kms of 33kv incomer.	
North Rift /Central Rift Region Lot 2 Distribution substations and lines	<ul style="list-style-type: none"> 3 No. 33 KV take-off bays for Nyaru, Turbo and Burnt forest 33KV feed-outs Upgrade 33kv busbars to indoor GIS switch gear Upgrade 11kv indoor 11kv board 	<ul style="list-style-type: none"> Nyaru 7.5 MVA 33/11 KV Substation and 33 Kv switching station with SCADA associated control room and 2kms of 33 Kv & 5 Kms of outgoing 11KV lines. Turbo 7.5 MVA 33/11 KV Substation with SCADA, associated control room and 2 Kms of 33 Kv & 10 Kms of outgoing 11KV lines Burnt Forest 7.5 MVA 33/11 KV Substation and 33 Kv switching station with 3X33Kv bays with SCADA, associated control room and 10 Kms of outgoing 11KV lines Lanet 3 x 7.5 MVA 33/11 Kv Substation complete with SCADA, new 11 Kv 14 panel board 1 km of 11 kV overhead lines, 1 km 11 kV feed-out cables, 1 km 33 Kv single Core feed-in cables with associated feed-in bays. Establish a new 33kv double busbar GIS with 19 bays complete with protection and control. 	<ul style="list-style-type: none"> 2 receiving 33KV lines from Eldoret & Lassos, 3 outgoing 33KV feeders LILO 33KV bays at Turbo 3x7.5MVA 33/11kv s/s 2 x33kv switching stations 4km of 33kv 25km of 11kv 3x7.5MVA 33/1KV substation 33KV GIS Bays and Busbars 2x 11kv indoor board 2kmx 11kv lines 1km x33kv cable
West / South Nyanza Region Lot 3 Distribution substations and lines	<ul style="list-style-type: none"> 4 No. 33 KV incoming lines to Nyangusu, Maseno and Maraba. Upgrade Kilgoris Substation from 2.5 MVA to 7.5 MVA 33/11 Kv & include 	<ul style="list-style-type: none"> Nyangusu 7.5 MVA 33/11 KV Substation with associated control room and 29 Kms of outgoing 11KV lines Maraba 7.5 MVA 33/11 KV Substation with associated control room and 2 Kms of outgoing 11KV lines 20 Kms of 33 KV line from Kisian to Maseno 	<ul style="list-style-type: none"> 3x7,5MVA transformers 1 LILO to Nyangusu from the 33KV line to Kilgoris 13Kms 1LO from Kisian substation 1LO from Chemelil substation to Maraba 2 receiving 33KV lines from Kegati & Chemosit, 3 outgoing 33KV feeders to Transmara Sugar 25kms, Kilimapesa mines 34Kms and to substation 0.5Kms

The scope of services of the assignment include the following;

- Approve designs and attend Factory Acceptance Tests (on request) and Site Acceptance Tests for specific equipment
- Field Supervision of construction works
- Assisting with the interpretation of contractual items, establishment of progress measurement thresholds, and payment processing,
- Preparation of Monthly and Quarterly progress reports and
- Preparation of project completion reports

The consultancy services shall be one Activity: -

Activity 1: Implementation support

Activity 1 is expected to take 144 staff months. The activity shall be in two parts:

- a) Project Management and Supervision - Substation Works
Substation Design approvals, work plan review and approvals; development of project monitoring reports; factory testing, site testing, establishment of progress measurement thresholds; payment processing, witnessing substation testing and commissioning, interpreting contractual items as requested,
The pricing for this SHALL be TIME based.
- b) Project Management and Supervision - Line Works
Line equipment design approvals; Line route reviews; Line design approvals; Development of project monitoring reports, equipment factory testing, site testing, establishment of progress measurement thresholds and payment processing, witnessing line testing and commissioning, interpreting contractual items as requested,
The pricing for this SHALL be TIME based.

The scope includes:

- a) Review and Approval of the Contractor's designs to ascertain that they comply with the specifications and in accordance with sound engineering practice.
- b) Development of project monitoring tools to provide adequate up to date information on the project status and responsibilities.
- c) Holding regular planning and progress meetings to monitor progress, and prepare minutes of meetings.
- d) Monitor the progress of implementation including works supervision, project cash flow requirements and prepare regular quarterly reports to be forwarded to Agencie Francaise de Development
- e) Inspect and witness factory testing of specific equipment when requested at manufacturer's works.

- f) Giving all necessary instructions to the Contractor, provided that the Consulting Engineer shall not without the prior approval of the “Client” give any instructions which in the opinion of the Consulting Engineer are likely to substantially increase the cost of the Works.
- g) Checking of contractor’s invoices, issuing certificates for payment according to the conditions of contract.
- h) Checking of contractor’s claims in case of changes and verification that amounts tally with contractual rates.
- i) Ensure that the “Client” receives as-built installation drawings and O & M manuals where applicable.
- j) Confirm that the contractor has delivered to KPLC on the completion of the Works such records such as built drawings, manufacturers' manuals and O & M instructions as are reasonably necessary to enable the operation and maintain the works.
- k) At completion of works, witness commissioning tests, issue Project Completion Certificates and Take over Certificates.
- l) Technology transfer. In conducting the assignment, the consultant shall work with counterpart staff of the KPLC as part of on the job training to build capacity.

The consultants shall price the activity and put relevant costs for the activity listed in the appropriate financial forms.

4. Team Composition & Qualification Requirements for the Key Experts (and any other requirements which will be used for evaluating the Key Experts under Data Sheet 21.1)

The consultant shall select the best key personnel to meet the specific requirements of the assignment.

The team shall comprise of the following key experts but not limited to:

1. Project Manager

a. General Qualification

Minimum requirement:

- B.Sc. degree in Electrical Engineering. -
- 12 years’ experience in electrical power systems,
- 10 years’ experience in Distribution power substation design of up to 132 KV and sub-transmission lines

- 7 years in project management.

b) Adequacy

- Experience in leading/Managing the implementation of at least two (2) sub-transmission power lines and substation projects of up to 132kV in the last ten years.
- Design and commissioning of substations.

c) Language proficiency and experience in the Sub-Saharan African countries

- Fluency in English
- At least one (1) project in Sub-Saharan African countries

2 Design Engineer (Substations)

a) General Qualification

Minimum requirement:

- B.Sc. degree in Civil/ Electrical Engineering. -
- 10 years' experience in electrical power systems,
- 8 years' experience in substation design of up to 132 KV
- 5 years in project management.

b) Adequacy

- Experience in implementation of at least two (2) sub-transmission power lines and substation projects of up to 132kV in the last eight years.
- Design and commissioning of substations.

c) Language proficiency and experience in the Sub-Saharan African countries

- Fluency in English
- At least one (1) project in Sub-Saharan African countries

3 Construction Engineer (Substations)

a) General Qualification

Minimum requirement:

- B.Sc. degree in Electrical/ Civil Engineering. -
- 10 years' experience in electrical power systems,
- 8 years' experience in substation design and construction of up to 132 KV
- 5 years in project management.

b) Adequacy

- Experience in implementation of at least two (2) sub-transmission power lines and substation projects of up to 132kV in the last eight years.
- Design and commissioning of substations.

- c) Language proficiency and experience in the Sub-Saharan African countries
- Fluency in English
 - At least one (1) project in Sub-Saharan African countries

4 **Design Engineer (Lines)**

a) General Qualification

Minimum requirement:

- B.Sc. degree in Electrical Engineering. -
- 10 years' experience in electrical power systems,
- 5 years' experience in Distribution line design of up to 132 KV
- 3 years in project management.

b) Adequacy

- Experience in implementation of at least two (2) sub-transmission power lines and substation projects of up to 132kV in the last eight years.
- Design and commissioning of substations.

c) Language proficiency and experience in the Sub-Saharan African countries

- Fluency in English
- At least one (1) project in Sub-Saharan African countries

5 **Construction Engineer (Lines)**

a) General Qualification

Minimum requirement:

- B.Sc. degree in Electrical Engineering. -
- 10 years' experience in electrical power systems,
- 5 years' experience in Distribution power substation design and construction of up to 132 KV and sub-transmission lines
- 3 years in project management.

b) Adequacy

- Experience in implementation of at least two (2) sub-transmission power lines and substation projects of up to 132kV in the last eight years.
- Design and commissioning of power lines.

c) Language proficiency and experience in the Sub-Saharan African countries

- Fluency in English
- At least one (1) project in Sub-Saharan African countries

7. **Substation Protection and SCADA Expert**



a) General Qualification

Minimum requirement:

- B.Sc. degree in Electrical Engineering
- 8 years' experience in protection and control system.

a) Adequacy

- Experience in design and commissioning of substation control systems (SCS)/SCADA.
- Must have carried out design, testing and commissioning of at least two (2) substations above 20MVA transformation capacity in the last eight years.
- Experience in design and commissioning of tele-protection schemes

c) Language proficiency and experience in the Sub-Saharan African countries

- Fluency in English
- At least one (1) project in Sub-Saharan African countries.

8.. Reporting Requirements and Time Schedule for Deliverables

The consultant shall prepare and submit to the “Client” - the following documents and reports.

- Weekly Activity Reports
- Monthly Progress Reports
- Quarterly Review Reports
- Project Completion Reports

- Format and contents of the reports shall be agreed up during contract clarification., frequency, and contents of reports;*
- Electronic submission (or on CD ROM). Final reports shall be delivered in CD ROM in addition to the specified number of hard copies;*
- The reports will be sent and submitted to Michael Adhiambo, Manager Projects Development, 2nd floor Stima Investment Building on Mushembi Road Parklands-Nairobi*

6. Client’s Input and Counterpart Personnel

Facilities to be provided by the KPLC

The “Client” will provide the following facilities:

- Access to relevant information for the Projects.
- KPLC will NOT provide Office, Accommodation or Transport.



Counterpart Staff

Counterpart staff of at least one Engineer with knowledge of the Distribution System per lot will work with the Consultant on a need basis. They will assist in providing the relevant data. The counterpart staff shall be paid by “the Client and the work of the counterpart staff shall be the responsibility of the “Client”.



