TERMS OF REFERENCE
POWER BACKUP SOLUTION

1. Executive Summary

The Kenya Revenue Authority (KRA) depends on uninterrupted power to deliver critical online services, including revenue collection, document processing, and customer support. Frequent power outages pose operational and financial risks, threatening service continuity, data integrity, and stakeholder confidence.

To mitigate these risks, KRA plans to deploy a robust, grid-tied hybrid inverter and battery-based power backup system across its outstations. The solution will ensure continuous operations, safeguard critical infrastructure, maintain productivity, and enable real-time monitoring from the Network Operations Center (NOC).

The project encompasses site assessments, customized system design, professional installation, testing and commissioning, staff training, and ongoing maintenance and support. By implementing this solution, KRA will strengthen operational resilience, minimize downtime, and guarantee reliable service delivery to taxpayers nationwide.

2. Background

The Kenya Revenue Authority (KRA) is a statutory body mandated to collect revenue and facilitate trade and compliance across Kenya. Its operations rely heavily on stable electricity to support critical online services. Any power disruptions can adversely impact service delivery, compromise data, and erode stakeholder confidence.

KRA operates a network of outstations that provide essential services to taxpayers nationwide. These outstations require uninterrupted power to maintain operational efficiency, protect critical data, and ensure the integrity of IT systems and infrastructure. Frequent outages, voltage fluctuations, and blackouts pose significant risks to these operations.

To address these challenges, KRA intends to implement a scalable, reliable power backup solution across its outstations. The initiative focuses on deploying grid-tied hybrid inverters with battery-based storage capable of sustaining operations during utility power interruptions. The solution will enhance operational resilience, safeguard

critical infrastructure, maintain productivity, and support real-time monitoring from the NOC.

This initiative aligns with KRA's strategic objectives to strengthen business continuity, minimize service disruptions, and improve overall operational efficiency. Engaging qualified suppliers to design, supply, install, commission, and maintain these systems will ensure that all outstations remain fully operational, regardless of external power challenges.

3. Objectives

The primary objective of this project is to provide reliable and continuous power to KRA outstations during utility power interruptions. Specific objectives include:

- **Minimizing Downtime:** Ensure uninterrupted operations to maintain service delivery.
- **Data Protection:** Safeguard critical IT systems and data from power-related disruptions.
- **Maintaining Productivity:** Sustain operational efficiency even during power outages.
- **Equipment Protection:** Shield critical infrastructure from damage due to power surges or blackouts.
- **Operational Monitoring:** Enable real-time monitoring of the power backup systems from the Network Operations Center (NOC).

4. Scope of Work

The project will cover the following key activities:

I. **Site Assessment:** Conduct detailed assessments of each outstation to determine power requirements, existing electrical infrastructure, and specific operational needs.
II. **System Design:** Develop a customized grid-tied hybrid inverter and battery-based power backup system for each outstation, including integration with the NOC for monitoring and alerts.
III. **Procurement and Installation:** Supply, deliver, and professionally install the backup systems at all designated outstations.

IV. **Testing and Commissioning:** Perform rigorous testing to ensure systems operate reliably under all expected conditions and meet KRA's operational requirements.
V. **Training:** Provide comprehensive training to KRA staff on system operation, monitoring, and preventive maintenance.
VI. **Maintenance and Support:** Offer ongoing technical support, preventive maintenance, and real-time system monitoring to ensure optimal performance and longevity.

5. Deliverables

The service provider is expected to deliver:

I. **Site Assessment Report:** Documenting findings, recommendations, and power requirements for each outstation.
II. **Design and Specification Documents:** Detailed technical designs for the proposed power backup systems.
III. **Installation and Commissioning Report:** Verification that all systems have been successfully installed and tested.
IV. **Training Materials:** Manuals and guides for operational staff.
V. **Maintenance Plan:** Schedule and procedures for preventive and corrective maintenance.

6. Technical Approach, Methodology, and Implementation Plans

Bidders are required to submit a comprehensive technical approach and methodology for the design and implementation of a grid-tied hybrid inverter-based power backup solution. The technical proposal should address the following key aspects:

7.System Design Approach:

I. Clearly describe the approach for designing the inverter-based power backup solution, including any customization to meet specific site requirements.

II. Provide detailed specifications of the proposed system components, including the inverter, battery bank, and any additional equipment such as charge controllers, transfer switches, hubs, and related accessories.
III. Specify the power rating and capacity of the inverter and battery bank to ensure the system reliably supports the anticipated load demands and required runtime.
IV. Include details of all electrical cabling and clean power wiring, supported by approved circuit diagrams that comply with established safety and operational standards.
V. Provide insights on the efficiency, scalability, and reliability of the proposed design, demonstrating its suitability for continuous operational support at KRA outstations.

8. Methodology for Integration

I. Provide a detailed step-by-step methodology for integrating the inverter-based power backup system into the existing electrical infrastructure.
II. Outline any required modifications to the current electrical setup, including panel upgrades, cabling adjustments, grounding, or other necessary enhancements.
III. Describe measures to ensure safe, compliant, and reliable system integration, including protection mechanisms against overloads, short circuits, electrical faults, and other operational hazards.
IV. Highlight procedures for testing and validating the integration to confirm that the system operates seamlessly with existing infrastructure while meeting all regulatory and safety standards.

9. Implementation Timeline:

Provide a clear and detailed projected timeline, covering the following

I. Site Assessment and Report Submission projected 45 days
II. System Design and Approval projected 30 days
III. Installation of Backup Systems projected 180 days

IV. Testing and Commissioning projected 45 days
V. Training Completion projected 30 days
VI. Project Completion and Handover projected 14 days

10. Installation Process:

I. Outline the steps involved in the installation of the power backup solution, including site preparation, equipment delivery, installation, and connection to the grid or load.
II. Discuss the project team structure and any roles or expertise required for installation.
III. Mention the handling of any potential challenges or risks during the installation phase.

11. Commissioning and Testing Plan:

I. Describe the testing and commissioning procedures for the inverter-based power backup solution once installed.
II. Include a step-by-step methodology for testing the system's performance under various operational conditions, including load testing, battery discharge cycles, and inverter response times.
III. Detail on how the system will be validated to ensure it meets all design
IV. specifications and performance expectations

12. Training and Knowledge Transfer:

I. Detail the training approach for KRA personnel, including how to operate and maintain the inverter system.
II. Include manuals or instructional materials that will be provided.
III. Specify any on-site training sessions or online resources available to KRA.

13. Post-Implementation Support and Maintenance:

I. Provide the methodology for ongoing support and maintenance, including periodic inspections, troubleshooting, and remote monitoring (where applicable).

II. Include a warranty period and the process for addressing any post-implementation issues.
III. Describe any optional service contracts available for long-term maintenance and upgrades.

14. Risk Management and Mitigation Strategies:

I. Identify potential risks associated with the implementation of the inverter-based backup solution (e.g., power disruptions, equipment delays). Identify potential risks associated with the inverter-based backup solution when being charged by the stand-by generators in various stations and how to mitigate it.
II. Provide a mitigation strategy for each identified risk to minimize project disruption or delays.

15. Sustainability and Energy Efficiency:

I. Explain how the proposed system will contribute to energy efficiency and sustainability (e.g., eco-friendly components, low carbon footprint, energy-saving features).
II. Highlight any certifications or compliance with energy regulations or standards.

16.Organization and Staffing

Bidders are expected to Provide a brief description of their company, including experience in delivering similar projects by highlight company's track record in the implementation of power backup solutions and inverter installations

17. Key Personnel

Include short bios of the key team members who will be involved in the project. Mention their qualifications, years of experience, and specific roles in previous similar projects.

18.Project Management Team:

Bidders are expected to propose an individual responsible for leading the implementation of the inverter-based power backup solution, ensuring that the project stays on schedule, meets all specifications, and adheres to quality standards.

TABLE 1 VENDOR EVALUATION

Description of Criteria	**Maximum Scores**
Technical staff Qualifications. Bidder to propose **three (3)** Technical staff with the following valid qualifications: The training should be supported by professional certificates, certification in power backup system; 1. (a) A Relevant University Degree (2 marks); attach copies of certificate (b) A Relevant Academic Diploma/ Certificate attach copies of certificate (1 mark) 2. Valid OEM Certifications for the power backup components bided for (2 marks); attach copies of certificate At **least three (3)** years of experience in implementation of power backup system bided for (1 mark); (MUST attach copies of the certifications and CVs for each staff to score). Attach CV of each staff clearly indicating the sites where the staff had undertaken a similar support of equipment/solution bided for each staff to be evaluated.	15
Experience/Reputation of the Firm Provide evidence of past undertaking of similar projects (Implementation and support of power backup system Include a brief description of similar item delivered to three **(3)** clients in the last five (5) years. Bidder to indicate the value of contracts, contact person, phone number and email addresses). **Evidence to be attached is LSO/Contract with a corresponding Reference letter from client.** Each client is - **4 marks**	12
TOTAL SCORES	**27**
Cut Off Score	**20**

MINIMUM TECHNICAL SPECIFICATIONS FOR THE UPGRADE OF KRA POWER BACKUP SYSTEM SOLUTION UPGRADE COUNTRY WIDE (SUPPLY, DELIVERY AND INSTALLATION)

Instructions to Bidders

1. Bidders are required to fill the table below or use its format to respond.
2. Bidders **MUST** provide a substantive response for all features irrespective of any attached technical document. Use of Yes, No, tick, Compliant etc. will be considered non-responsive.
3. Bidders **MUST** append official company stamp and/or authorized signature on all attached technical data sheets.

TECHNICAL SPECIFICATIONS FOR POWERBACKUP SYSTEM REQUIREMENTS

TABLE 2 Technical Specifications for Hybrid PBS Inverter

	Feature	Minimum Specifications	Bidder's Response
1.	Make/ Model	Internationally recognized, mature brand that integrate seamlessly with Outback VFX3024E inverter	
2.	Type	Hybrid (capable of getting input power from grid and solar) The Inverter should be accompanied with its MPPT so as to be Solar ready	
3.	Supported modes	Programmable for 7 different modes with Generator assist	
4.	Grid Input	230 – 240 VAC	
5.	Size	2KVA, 3KVA	
6.	Modularity	Modular, Stackable up to 9 inverters in 3-phase and 10 in grid tied Supports Both off-grid and grid-tied functionality	
7.	Battery Input	24V DC	
8.	Output	230 – 240 VAC pure sine wave	
9.	efficiency	At least 93%	
10.	Protection & Safety	Provide over voltage, short circuit protection,	
11.	Operating Environment	Inverter chassis designed to operate in the harshest environmental conditions such as high temperatures, humidity or corrosive salt air	
12.	Monitoring and Communication	Built-in networked communications Field system upgradability Capable of being monitored from centrally KRA LAN	

13.	Battery Charging capability	Advanced Battery Charging (ABC) with expanded charging voltages and time parameters	
14.	Warranty	At least 3 years	

TABLE 3 Technical Specifications for PBS Battery 1200 Ah

	Feature	**Minimum Requirements**	**Bidder's Response**
1.	Model	Internationally recognised, Heavy Duty, Deep Cycle, Gel Battery	
2.	Battery type	OPzV, Valve Regulated Lead Acid (VRLA) Battery that adopts immobilized GEL & Tubular Plate Technology	
3.	Construction Design.	Non-Spillable, Fire resistant ABS (UL94-HB) containers and covers	
4.	Terminal	F10 (M8 x 20mm) Copper Terminals	
5.	Internal Resistance	Not more than 0.5mΩ at full charge (25°C)	
6.	Power Rating	2V, ***1200Ah***@10hr-rate to 1.80V per cell @25°C	
7.	Max. Charging current	300A	
8.	Usage/Environment	Indoor use as per standards CE / UL / ISO9001 / ISO14001 **(Attach Certificates)**	
9.	Size/ dimensions (in mm) (L x W x H)	Approx. 280 x 250 x 830 mm	
10.	Weight	Not more than 120Kg per battery	
11.	Battery Stand	Every 12 batteries to be supplied with a metallic stand	
12.	Safety	Safety valve installation for explosion proof Safety valve: EPDR	
13.	Cyclic Use Voltage	2.37V – 2.40V @ 25°C	
14.	Float Charging/ Standby use	2.25V – 2.30V @25°C	
15.	Self Discharge	Less than 2% of capacity declined per month at (20°C), can be stored for 6 months at 25°C	
16.	Expected designed Floating Life	At least Ten (15) years.(Proof required; Attach brochures))	
17.	Warranty	At least three (3) years onsite repair or immediate replacement.	

TABLE 4 Technical Specifications for PBS Battery (1500Ah)

	Feature	Minimum Requirements	Bidder's Response
18.	Model	Internationally recognised, Heavy Duty, Deep Cycle, Gel Battery	
19.	Battery type	OPzV, Valve Regulated Lead Acid (VRLA) Battery that adopts immobilized GEL & Tubular Plate Technology	
20.	Construction Design.	Non-Spillable, Fire resistant ABS (UL94-HB) containers and covers	
21.	Terminal	F10 (M8 x 20mm) Copper Terminals	
22.	Internal Resistance	Not more than 0.5mΩ at full charge (25°C)	
23.	Power Rating	2V, **1500Ah**@10hr-rate to 1.80V per cell @25°C	
24.	Max. Charging current	300A	
25.	Usage/Environment	Indoor use as per standards CE / UL / ISO9001 / ISO14001 **(Attach Certificates)**	
26.	Size/ dimensions (in mm) (L x W x H)	Approx. 280 x 250 x 830 mm	
27.	Weight	Not more than 120Kg per battery	
28.	Battery Stand	Every 12 batteries to be supplied with a metallic stand	
29.	Safety	Safety valve installation for explosion proof Safety valve: EPDR	
30.	Cyclic Use Voltage	2.37V – 2.40V @ 25°C	
31.	Float Charging/ Standby use	2.25V – 2.30V @25°C	
32.	Self Discharge	Less than 2% of capacity declined per month at (20°C), can be stored for 6 months at 25°C	
33.	Expected designed Floating Life	At least Ten (15) years.(Proof required; Attach brochures))	
34.	Warranty	At least three (3) years onsite repair or immediate replacement.	

TABLE 5 Minimum Technical Specifications for Outback Mate 3s

	Feature	Minimum Requirements	Bidder's Response
1.	General Descriptive Requirement	The mate should be able to Monitor, command and control from KRA intranet with the use of OPTICS RE installed Outback VFX 3024 inverters in various offices.	
2.	Model and Technology	Outback. For programming and monitoring Outback inverter.	
3.	Setpoint Adjustment & Navigational controls	Touch sensitive scroll wheel and 5 navigational keys	
4.	Computer Interface	HTML system status dashboard over LAN. Should be accompanied by OPTICS RE software.	
5.	Security	Ability to set unique multi-level user passwords in order to secure critical system settings from unintended changes	
6.	Clock/ Calendar	Built-in real time clock with battery backup	
7.	Microprocessor	80MHz 32 bit processor	
8.	Set point & Data Memory	8Mb RAM/ 64Mb of flash RAM	
9.	Communication Protocols	Should support Proprietary OutBack Power communications protocol and SunSpec Modbus	
10.	Data Logging	Up to 1 year. Should have an SD memory card slot to increase data logging capacity.	
11.	Included cabling	Standard CAT5 network cable with RJ-45 modular jack (6ft / 2m)	
12.	Environmental Rating	Indoor Type I (IP 30)	
13.	Operating Temperature Range	0 to 50°C	
14.	Warranty & Support	Minimum one (1) year.	

TABLE 6 Minimum Technical Specifications for Outback Hub Communication Manager

	Feature	Minimum Requirements	Bidder's Response
1.	General Descriptive Requirement	The OutBack HUB System Communications Manager allows multiple OutBack devices to connect and integrate at one point via CAT5e/6 cable WITH RJ45 modular jacks.	
2.	Model and Technology	Outback.	
3.	Type / Size	Ten component ports plus a MATE port (Hub 10)	
4.	Computer Interface	HTML system status dashboard over LAN. Should be accompanied by OPTICS RE software.	
5.	Security	Ability to set unique multi-level user passwords in order to secure critical system settings from unintended changes	
6.	Clock/ Calendar	Built-in real time clock with battery backup	
7.	Microprocessor	80MHz 32 bit processor	
8.	Set point & Data Memory	8Mb RAM/ 64Mb of flash RAM	
9.	Communication Protocols	Should support Proprietary OutBack Power communications protocol and SunSpec Modbus	
10.	Data Logging	Up to 1 year. Should have an SD memory card slot to increase data logging capacity.	
11.	Included cabling	Standard CAT5 network cable with RJ-45 modular jack (6ft / 2m)	
12.	Environmental Rating	Indoor Type I (IP 30)	

TABLE 7 Specifications/ BoQs for Electrical Accessories

1.	Item	No	Bidder's Response
2.	Electrical Cable **Pure Copper** - 3 CORE (TWE) Flexible 2.5 SQ. MM, 90 metres roll (**Black Color**). UK/ASL Standard.	Pcs	

3.	Electrical Cable **Pure Copper** - 3 CORE (TWE) Flexible 4.0 SQ. MM, 90 metres roll (**Black Color**). UK/ASL Standard.	Pcs	
4.	Electrical Cable **Pure Copper** - 3 CORE (TWE) Flexible 6.0 SQ. MM, 90 metres roll (**Black Color**). UK/ASL Standard.	Pcs	
5.	Battery Cables (Single Core Flex 75.0 SQ. MM,**Pure Copper)**	Meters	
6.	Battery Cable Lugs-(SC 95-110)	pcs	
7.	Battery Cable Lugs-(SC 70-10)	pcs	
8.	Metallic trunkings 2 compartments (**Powder Baked Paint), White Color,** 200mm by 50 mm (Box type)	Pcs	
9.	Metallic Double Knockouts/ Faceplates (**Powder Baked Paint), White Color,** 200mm (Box type)	Pcs	
10.	16 way 3 phase Consumer unit (**Metallic Enclosure Baked Powder Finish)** Complete with breakers (32 amps single pole) mult-9/Merlin Gerlin standard.	Pcs	
11.	8 way Consumer unit (**Metallic Enclosure Baked Powder Finish)** Complete with breakers (32 amps single pole) mult-9/Merlin Gerlin standard.	Pcs	
12.	4 way Consumer unit **(Metallic Enclosure Baked Powder Finish)** Complete with breakers (32 amps single pole) mult-9/Merlin Gerlin standard.	Pcs	
13.	Input Protective Stand-alone MCB Double pole 32 Amps with enclosure/housing, wall mountable- mult-9/Merlin Gerlin standard	Pcs	
14.	Input Protective Stand-alone MCB Double pole 63 Amps with enclosure/housing, wall mountable- mult-9/Merlin Gerlin standard	Pcs	
15.	Rotary Change-Over switch **100 Amps/400 Volts,** with at least 4 poles -3 independent positions (ON 1, OFF & ON2) -PVC/Glass Re-Enforced Plastic -At least 100 Amps, /400 V ac	Pcs	
16.	Double Electrical Sockets Outlets **Red Color**- Complete with Deep Patrice Boxes, UK Standard with on/off switch	Pcs	

17.	PVC trunkings 50mm*50 mm Trunkings (white Color) 3 meters length)	Pcs	
18.	PVC Flex Conduit **(black)** 32 mm Dia, 20 Meters roll	Pcs	
19.	PVC Flex Conduit **(black)** 25 mm Dia, 20 Meters roll	Pcs	
20.	Metallic U Shaped Saddle Clips 32 mm. diametre	Pcs	
21.	Metallic U Shaped Saddle Clips 25 mm. diametre	Pcs	
22.	PVC 25 mm Diameter conduit pipes 3 meters length (plus couplers) . Pipes to be Black color heavy gauge.	Pcs	
23.	PVC 32 mm Diameter conduit pipes 3 meters length (plus couplers) . Pipes to be Black color heavy gauge.	Pcs	
24.	Screw Bolts - **Coach Steel Screws Zinc Plated,** M10 x 60 mm- UK Standard	Pcs	
25.	Plastic Rawl Plugs – Plug measures 8mm Dia x 50mm, **Blue Color**,UK Standard	Pcs	
26.	Self-tapping screws Size - S 8 X 1 Inch- UK Standard	Pcs	
27.	Pvc Electrical Insulating Tapes, 20 yards	Pcs	
28.	Contact adhesive Glue 300 ml	Pcs	
29.	Cable Ties, 10 Inches long, Molded Flexible Nylon, weather resistant, tested to UL. Standard 62275	Pcs	
30.	Strip Connectors (100 amps capacity)	Pcs	
31.	Junction Boxes (100 mm*100 mm*70 mm, metallic) with Strip Connectors 100 amps capacity.	Pcs	
32.	Labour, Installation and Warranty period of 1 Year for the above	lot	

PRICE SCHEDULES

Notes:

1. Prices are to be given for each station as per location in the table below.
2. The price to be quoted is inclusive of the Inverter equipment, Batteries, Electrical accessories/wiring and the labour charges for the installation of each station.
3. A proper site survey is to be done by the vendor in order to capture the

requirements correctly in accordance with KRA's expectation of the scope of works.

4. The table below assumes each inverter will comprise power capacity of 3 KVA. 1 Battery set will comprise of 12 pcs of 2 Volts 1500 AH batteries.

TABLE 8: NAIROBI REGION

No.	LOCATION	Existing capacity (kva)	Requirements for new installations	Requirements for upgrades (existing PBS)	PRICE (KES)
1	Times Tower	None	70 Inverter sets, 36 Battery sets	N/A	
2	JKIA - Airport	18		6 Inverter Sets, 2 Battery sets	
3	JKIA (Cargo scanner)	1.5		1 Inverter Set, 1 Battery set	
4	Wilson airport CSD	3		1 Inverter Set, 1 Battery set	
5	JKIA(baggage hall)	1.5		4 Inverter Sets, 2 Battery sets	
6	JKIA Terminal 1E	NONE	1 Inverter Set, 1 Battery set		
7	JKIA Exports	NONE	1 Inverter Set, 1 Battery set		
8	JKIA KPC Depot	NONE	1 Inverter Set, 1 Battery set		
9	Wilson Departures	NONE	1 Inverter Set, 1 Battery set		
10	Wilson DTD	NONE	6 Inverters, 2 Battery sets		
11	Athi River EPZ	NONE	1 Inverter Set, 1 Battery set		
12	ICD Gate Ramp	NONE	1 Inverter Set, 1 Battery set		
13	ICD Pepe	NONE	1 Inverter Set, 1 Battery set		
14	Railways HQ Boma	NONE	1 Inverter Set, 1 Battery set		
15	Railways Gate Ramp	NONE	1 Inverter Set, 1 Battery set		
16	Sameer	NONE	65 Inverter Sets, 36 Battery sets		
17	Ushuru Pension Towers(CBC)	NONE	65 Inverter Sets, 36 Battery sets		
18	Ushuru Pension Plaza	NONE	50 Inverter Sets, 30 Battery sets		

	(Fortis)				
19	City Hall	NONE	1 Inverter Set, 1 Battery set		
20	City Square (Nairobi PPO)	NONE	1 Inverter Set, 1 Battery set		
21	KESRA Podo Park	NONE	6 Inverter Sets, 2 Battery sets		
22	Swissport	NONE	1 Inverter Set, 1 Battery set		
23	ACHL	NONE	1 Inverter Set, 1 Battery set		
24	DHL	NONE	1 Inverter Set, 1 Battery set		
25	Siginon Freight	NONE	1 Inverter Set, 1 Battery set		

TABLE 9: WESTERN REGION

No.	LOCATION	Existing Capacity (kva)	Requirements for new installations	Requirements for upgrades (existing PBS)	PRICE (KES)
1	Kisumu ICD	1.5		1 Inverter Set, 1 Battery set	
2	Kisumu Airport	1.5		1 Inverter Set, 1 Battery set	
3	Kisumu pier	1		1 Inverter Set, 1 Battery set	
4	Kisumu customs	12		4 Inverter Sets, 2 Battery sets	
5	Lake Basin Mall	12		4 Inverter Sets, 2 Battery sets	
6	Sio port	1		1 Inverter Set, 1 Battery set	
7	Usenge	1		1 Inverter Set, 1 Battery set	
8	Busia	3		2 Inverter Set, 2 Battery set	
9	Kakamega	12		4 Inverter Sets, 2 Battery sets	
10	Kericho DTD	1		4 Inverter Sets, 2 Battery sets	
11	Isebania	6		2 Inverter Sets, 2 Battery sets	
12	Kisii (Posta Office)	6		2 Inverter Sets, 2 Battery sets	
13	Kisii TSO (DC's Office)	3		2 Inverter Sets, 2 Battery set	

14	Muhuru bay Customs	1		1 Inverter Set, 1 Battery set	
15	Mbita	3		2 Inverter Set, 1 Battery set	
16	Nyamtiro	1		1 Inverter Set, 1 Battery set	
17	Lwakhakha	3		1 Inverter Set, 1 Battery set	
18	Bungoma	9		2 Inverter Sets, 2 Battery sets	
19	Malaba	12		4 Inverter Sets, 2 Battery sets	
20	Kopanga	NONE	1 Inverter Set, 1 Battery set		
21	Migori	NONE	2 Inverter Sets, 1 Battery set		
22	Homa bay	NONE	2 Inverter Sets, 1 Battery set		
23	Muhuru bay Town Office	NONE	1 Inverter Set, 1 Battery set		

TABLE 10: NORTH RIFT REGION

	LOCATION	**Existing Capacity (kva)**	**Requirements for new installations**	**Requirements for upgrades (existing PBS)**	**PRICE (KES)**
1	Eloret Kiptagich house	18		4 Inverter Set, 2 Battery set	
2	Eloret Kiptagich house (7th floor and ITax ground floor)	NONE	4 Inverter Set, 1 Battery set		
3	Eldoret Customs Warehouse (NCPB)	3		1 Inverter Set, 1 Battery set	
4	Eloret Kipgtagich house (ITAX Centre)	NONE	2 Inverter Set, 1 Battery set		
5	Eldoret Airport (Scanner)	1.5		1 Inverter Set, 1 Battery set	
6	Eldoret Airport (Cargo)	NONE	1 Inverter Set, 1 Battery set		

7	Eldoret Airport (Arrivals)	NONE	1 Inverter Set, 1 Battery set		
8	Suam	3		2 Inverter Set, 1 Battery set	
9	Lokichogio	NONE	1 Inverter Set, 1 Battery set		
10	Kitale	6		1 Inverter Set, 1 Battery set	
11	Lodwar Customs	3		1 Inverter Set, 1 Battery set	
12	Lodwar DTD	3		1 Inverter Set, 1 Battery set	
13	Kapenguria	NONE	1 Inverter Set, 1 Battery set		
14	Kapsabet	NONE	1 Inverter Set, 1 Battery set		
15	Kabarnet	NONE	2 Inverter Set, 1 Battery set		
16	Iten	NONE	2 Inverter Sets, 1 Battery set		
17	Eldama Ravine	NONE	2 Inverter Set, 1 Battery set		
18	kakuma	NONE	1 Inverter Set, 1 Battery set		
19	Nadapal (New OSBP)	NONE	1 Inverter Set, 1 Battery set		
20	Kainuk	NONE	1 Inverter Set, 1 Battery set		

TABLE 11 SOUTH RIFT REGION					
No.	**LOCATION**	**Existing Capacity (kva)**	**Requirements for new installations**	**Requirements for upgrades (existing PBS)**	PRICE (KES)
1	Naivasha	9		3 Inverter Set, 2 Battery set	
2	Maralal	3		1 Inverter Set, 1 Battery set	

3	Narok	6		2 Inverter Set, 1 Battery set	
4	Nakuru	12		4 Inverter Set, 2 Battery set	
5	Nakuru KPC	NONE	1 Inverter Set, 1 Battery set		
6	Nakuru 3rd Floor Gen. Hse	NONE	4 Inverter Sets, 1 Battery set		
7	Nakuru iTax Support Centre	NONE	2 Inverter Sets, 1 Battery set		
8	Nakuru PPO	NONE	1 Inverter Set, 1 Battery set		
9	ICD Naivasha/SGR	NONE	1 Inverter Set, 1 Battery set		
10	Kericho RRU	NONE	1 Inverter Set, 1 Battery set		
11	Kericho iTax	3		1 Inverter Set, 1 Battery set	
12	Kericho DTD Main Office	3		2 Inverter Set, 1 Battery set	
13	Nyahururu	3		2 Inverter Set, 1 Battery set	

TABLE 12: NORTHERN REGION

No.	LOCATION	Existing Capacity (kva)	Requirements for new installations	Requirements for upgrades (existing PBS)	PRICE (KES)
1	Embu	12		4 Inverter Sets, 2 Battery set	
2	Meru	12		4 Inverter Sets, 2 Battery set	
3	Chuka	NONE	1 Inverter Set, 1 Battery set		
4	Maua	NONE	1 Inverter Set, 1 Battery set		
5	Isiolo	6		2 Inverter Sets, 1 Battery set	
6	Isiolo Air Port	NONE	1 Inverter Set, 1 Battery set		
7	Marsabit	NONE	2 Inverter Sets, 1 Battery set		
8	Garissa	NONE		6 Inverter Sets, 2 Battery sets	

9	Liboi	1.5		1 Inverter Set, 1 Battery set	
10	Moyale	4.5		1 Inverter Set, 1 Battery set	
11	Wajir town office	3		1 Inverter Set, 1 Battery set	
12	Wajir scanner	1.5		1 Inverter Set, 1 Battery set	
13	El wak	1.5		1 Inverter Set, 1 Battery set	
14	Mandera	1.5		1 Inverter Set, 1 Battery set	
15	Namanga	6		2 Inverter Sets, 1 Battery set	
16	Machakos	9		3 Inverter Sets, 1 Battery set	
17	Loitoktok	1.5		2 Inverter Sets, 1 Battery set	
18	Kitui	3		2 Inverter Sets, 1 Battery set	
19	Diffu	NONE	1 Inverter Set, 1 Battery set		
20	kajiado	NONE	1 Inverter Set, 1 Battery set		
21	kitengela	NONE	2 Inverter Sets, 1 Battery set		
22	Wote	NONE	1 Inverter Set, 1 Battery set		
23	Taru	NONE	1 Inverter Set, 1 Battery set		
24	Emali	NONE	1 Inverter Set, 1 Battery set		
25	Machakos RRU	NONE	1 Inverter Set, 1 Battery set		

TABLE 13: CENTRAL REGION

No.	LOCATION	Existing Capacity (kva)	Requirements for new installations	Requirements for upgrades (existing PBS)	PRICE (KES)
1	Thika	12		6 Inverter Sets, 4 Battery sets	
2	Nyeri	12		8 Inverter Set, 4 Battery sets	
3	Kerugoya	6		1 Inverter Set, 1 Battery set	

4	Muranga	3		1 Inverter Set, 1 Battery set	
5	Nanyuki	3		1 Inverter Set, 1 Battery set	
6	Kiambu	2		2 Inverter Sets, 2 Battery set	
7	Thika KVM	NONE	1 Inverter Set, 1 Battery set		

TABLE 14: SOUTHERN REGION

No.	LOCATION	Capacity (kva)	Requirements for new installations	Requirements for upgrades (existing PBS)	PRICE (KES)
1	KESRA Mombasa	18		8 Inverter Sets, 4 Battery sets	
2	MOMBASA Customs House	90		32 Inverter Sets, 14 Battery sets	
3	Customs House Security Office	3		1 Inverter Set, 1 Battery set	
4	Kilindini Gate 18	12		4 Inverter Set, 2 Battery set	
5	Kilindini shed 5	12		4 Inverter Set, 2 Battery set	
6	Mariakani	1		1 Inverter Set, 1 Battery set	
7	Voi	3		1 Inverter Set, 1 Battery set	
8	Malindi DTD	6		2 Inverter Set, 2 Battery set	
9	Malindi airport	3		1 Inverter Set, 1 Battery set	
10	Kilifi	1.5		1 Inverter Set, 1 Battery set	
11	Shimoni	1.5		1 Inverter Set, 1 Battery set	
12	Shimoni Jetty	5		1 Inverter Set, 1 Battery set	
13	Vanga	1		1 Inverter Set, 1 Battery set	
14	Kiunga	1.5		1 Inverter Set, 1 Battery set	
15	Lunga lunga Main Office	3		1 Inverter Set, 1 Battery set	
16	Lunga lunga Verification Office	3		1 Inverter Set, 1 Battery set	

17	Kilindini Enforcement	NONE	1 Inverter Set, 1 Battery set		
18	Kilindini RMG	NONE	1 Inverter Set, 1 Battery set		
19	Malindi iTax Customer Care	6		2 Inverter Sets, 2 Battery sets	
20	Ukunda/Diani	NONE	3 Inverter Sets, 1 Battery set		
21	Mombasa Old Port	NONE	1 Inverter Set, 1 Battery set		
22	MIAP Baggage Hall	3		1 Inverter Set, 1 Battery set	
23	MIAP Freight Terminal	3		1 Inverter Set, 1 Battery set	
24	Taveta Main Office	3		1 Inverter Set, 1 Battery set	
25	Taveta Verification Office	3		1 Inverter Set, 1 Battery set	
26	Lamu DTD	6		1 Inverter Set, 1 Battery set	
27	Lamu (manda) Airport	NONE		1 Inverter Set, 1 Battery set	
28	Lamu LAPSSET	NONE	2 Inverter Sets, 1 Battery set		
29	Mazeras RRU	NONE	1 Inverter Set, 1 Battery set		
30	Taru RRU	NONE	1 Inverter Set, 1 Battery set		
31	Ngomeni	NONE	1 Inverter Set, 1 Battery set		

Requirements schedule Summary

Note:

For all the Power Backup inverters, charge controllers and other accessories, Bidders are required to specify based on site requirements.

TABLE 15: GRAND PRICE SCHEDULE (COUNTRYWIDE)

KRA COUNTRY WIDE POWER BACKUP SYSTEM (PBS) CAPACITY REQUIREMENTS SUMMARY					
	KRA REGION	**(A). PBS CAPACITY REQUIRED IN KVA**	**(B). BATTERY SETS REQUIRED**	**(C). WIRING ACCESSO**	**TOTAL PRICE (A+B+**

			(12 PCS OF 2 V, 1500 AH)	RIES/LAB OUR	C), (KES)
1	NAIROBI REGION	869	163		
2	WESTERN REGION	138	33		
3	NORTH RIFT REGION	93	21		
4	SOUTH RIFT REGION	75	15		
5	NORTHERN REGION	117	28		
6	CENTRAL REGION	60	15		
7	SOUTHERN REGION	240	51		
		GRAND TOTAL			

FINANCIAL REQUIREMENT

- N/B: Bidders to provide a detailed breakdown of how they have arrived at the total cost
- Grand Total Cost –To be carried Forward to the FORM FIN 2 Summary of Costs