Government of Papua New Guinea
National Information and Communications Technology Authority

National Information and Communications Technology Authority

UNIVERSAL ACCESS AND SERVICE (UAS)

REQUEST FOR PROPOSALS (RFP)

CONNECT OUR SCHOOLS PROJECT (CSP)

LOT 1

PROVISION OF POWER SYSTEMS

NATIONAL INFORMATION AND COMMUNICATIONS TECHNOLOGY
UNIVERSAL ACCESS AND SERVICE (UAS)
STRATOS AVENUE
RANGEVIEW PLAZA (LVL 3)
PORT MORESBY

SEPTEMBER-OCTOBER 2024

Contents

SUMMARY AND BACKGROUND

National Information and Communications Technology Authority (NICTA) is seeking Request for Proposals (RFP) from experienced and qualified Power Systems Providers to supply and install back-up power systems for schools participating in Lot 1 of the *'Connect our Schools Project'* (CSP). These systems will ensure uninterrupted power supply to the broadband internet infrastructure, thereby enhancing the learning environment and digital literacy of students.

The CSP is an initiative that aims to enhance digital learning by providing reliable internet connectivity powered by sustainable energy solutions to students and teachers in underserved schools across the country. This project is driven by the recognition that digital literacy and access to online educational resources are critical components of modern education to enhance learning activities.

1. PROPOSAL GUIDELINES

This RFP is open to all qualified Power System Providers and Suppliers who can demonstrate the ability to meet the project's requirements. All submitted proposals must comply with the guidelines provided in this document. Proposals that fail to meet the requirements of this RFP will not be considered.

Proposals should be comprehensive and address all the elements listed in the scope of work, including technical specifications, project timelines, and budget. Bidders must provide detailed information about their experience, qualifications, and proposed solutions.

Proposals must be prepared and submitted using the proposal template that will accompany this RFP. A guideline for completing the template is also included in the same for reference.

Proposals must be received by **4pm** on **4th October 2024**. Any proposals received after this deadline will not be considered.

Proposals must be submitted electronically **ONLY** to uas@nicta.gov.pg. Any inquiries regarding this RFP should be directed to uas@nicta.gov.pg. Mr. Robert Griffin from NICTA will oversee the project and facilitate communication.

2. PROJECT PURPOSE AND DESCRIPTION

Project Purpose:

The CSP aims to enhance the learning environment in Papua New Guinea's schools by providing uninterrupted backup power systems that ensure continuous broadband internet connectivity and hotspot Wi-Fi, supporting educational activities.

Project Description:

The CSP, funded by the Universal Access and Service Fund through NICTA, aims to enhance the learning environment in schools across Papua New Guinea by integrating technology into education. Each selected school will be equipped with uninterrupted backup power systems to ensure continuous fixed broadband internet connectivity and hotspot Wi-Fi.

In partnership with relevant stakeholders, this initiative seeks to improve the quality of education by enabling schools to effectively incorporate technology into their teaching processes. This RFP invites experienced power providers to submit proposals for implementing the power systems at the selected schools.

3. PROJECT SCOPE

The successful bidder will be required to:

3.1 System Design:

- ✓ Provide all detailed electrical and mechanical design, including layout and wiring diagrams. Your design should be based on the assumed total ***daily energy consumption rate of 20-30kWh***.

3.2 Supply of Equipment:

- ✓ Provide all necessary components of the power system, including but not limited to solar panels, inverters, batteries, mounting structures, remote monitoring system, fuses, wiring and any other required accessories.
- ✓ Provide logistics of equipment to accessible schools within Central Province only.

3.3 Installation of Services:

- ✓ Professional installation of the power systems at identified schools, ensuring all safety and performance standards are met.

3.4 Testing and Commissioning:

- ✓ Test and Commission the systems to ensure they are fully operational and capable of supporting the broadband internet service and essential building loads.

3.5 Training and support:

- ✓ Provide training for school staff on the use and basic management of the power systems.
- ✓ Offer ongoing technical support and maintenance services to ensure the longevity and reliability of the installations.

4. PROJECT TIMELINE

Request for Proposal Timeline:
All proposals are to be submitted by **4pm 4th October, 2024** via email ONLY to uas@nicta.gov.pg with the Subject ***Proposal for CSP - LOT 01 Provision of Power Systems***;

Evaluation of proposals will be conducted within two weeks from the deadline of the submission. If additional information or discussions are needed with any bidders during this two-week window, the bidder(s) will be notified.

The selection decision for the winning bidder will be made two weeks after the evaluation of the proposals. Upon notification, the contract negotiation with the winning bidder will begin.

Notifications to bidders who were not selected will be done after the completion of the evaluation.

Project Timeline:

The project timeline for the delivery and installation of services will commence upon the signing of the project agreement. For locations with easy accessibility, the timeline shall not exceed 1 month from the agreement date. For sites situated in remote areas where logistics and access present challenges, the timeline shall be extended to a maximum of 2 to 3 months.

5. PROJECT MANAGEMENT AND COMMUNICATION

Regular communication and updates will be maintained between NICTA and the successful supplier.

Questions relating to this RFP may be directed to uas@nicta.gov.pg. Mr. Robert Griffin from NICTA will oversee the project and facilitate communication.

6. PROJECT BUDJECT

The project will be funded by NICTA through the UAS Fund. A project amount of **K300,000.00** *(GST incl.)* has been set aside for this project.

7. BIDDERS QUALIFICATION

Bidders should provide the following as part of their proposal for consideration:

- Contact Information;
- IPA Certificate to conduct business in PNG;
- TIN Certificate in accordance with tax regulations for businesses in PNG;
- Experience from past or similar projects.

8. PROPOSAL EVALUATION CRITERIA

Price will be a significant factor in our evaluation, but not the sole factor. We are looking for a supplier that delivers the best value with respect to investment. Proposals should demonstrate a clear understanding of project objective and how their pricing structure aligns with those objectives. NICTA will evaluate the proposals based on the following criteria:

- **Compliance:** Adherence to the RFP requirements and compliance with relevant standards and regulations.
    - National Energy Authority (NEA) Certifications and licences.
- **Technical Approach:** The quality and feasibility of the proposed technical solution proposed.
- **Experience and Qualifications:** Relevant experience, past performance, and qualifications of the bidder.
- **Cost-effectiveness:** Competitiveness and clarity of the cost proposal and value for money.
- **Project Timeline:** Delivery timeline and ability to meet project deadlines.

- **Support and Maintenance:** Capability to provide ongoing support and maintenance.
- **Innovation and Value-Added Service:** Any additional value-added services or innovative approaches proposed.

9. CHANGE MANAGEMENT

Any proposed changes to the project scope, schedule, or budget will be submitted in writing and approved by both parties.

10. CONFIDENTIALITY

All information submitted in proposals will be treated as confidential.

ANNEXURE

A. Project Sites

a) List of Schools in LOT 1:

Name	Province	District	Budget
Boera Primary School	Central	Hiri-Koiari	K70,000
Papa Junior High School	Central	Hiri-Koiari	K70,000
Tubusereia Junior High School	Central	Hiri-Koiari	K70,000
Kiriwina Secondary School	Milne Bay	Kiriwina-Goodenough	K90,000

Note: NICTA reserves the right to change the recipient school without prior notice.

B. Technical Specifications

Two distinct power systems are proposed for the schools, each with specific configurations.

The first system is a fully independent off-grid power solution designed for Kiriwina Secondary School in the Milne Bay Province.

The second system is a grid-tied Battery Energy Storage System (BESS), operating mainly on grid power with batteries in standby mode. This system automatically switches between grid and battery power, allowing the batteries to be recharged from the grid. The battery system should operate at 80% depth of discharge. This system will be deployed in schools in the Central Province only.

The proposed power systems must meet the following technical specifications:

a) **Off-Grid Power System:**

Component	Specifications
Solar Panels	✓ *Type:* Monocrystalline. ✓ *Efficiency:* ≥ 18% efficiency. ✓ *Operating Temperature Range:* -40°C to +85°C. ✓ *Warranty:* 25 years performance warranty, 10 years product warranty. ***Note:*** *The system should be configured to use solar power during sunny days, with the batteries remaining in standby mode.*
Inverter	✓ *Type:* Pure Sine Wave Inverter (Hybrid Off-Grid). ✓ *Power Rating:* 8-10 kW continuous output, 10-12 kW peak output (for surge loads).

	✓ *DC Input Voltage:* 48Vdc (compatible with *LiFePO$_4$* battery bank). ✓ *AC Output Voltage:* 240V/415V AC, single-phase/3-phase, 50Hz. ✓ *Efficiency:* ≥ 95%. ✓ *Integrated Features:* MPPT charge controller, battery charger. ✓ *Protection:* Overload, short-circuit, over-temperature, over/under-voltage protection.
Battery Bank	✓ *Type:* Lithium Iron Phosphate (*LiFePO$_4$*). ✓ *System Voltage:* 48Vdc. ✓ *Days of Autonomy:* 1-3 days. ✓ *Cycle Life:* ≥ 3,000 cycles at 80% Depth of Discharge (*LiFePO$_4$*). ✓ *Depth of Discharge (DoD):* 80% (*LiFePO$_4$*). ✓ *Charge/Discharge Efficiency:* ≥ 90% (*LiFePO$_4$*). ✓ *Operating Temperature Range:* 0°C to +60°C (charge), -20°C to +60°C (discharge). ✓ *Battery Management System (BMS):* Integrated BMS for *LiFePO$_4$* batteries. ✓ *Warranty:* 5-10 years (*LiFePO$_4$*). ***Note:*** *The batteries should power the system only on cloudy days, while on sunny days, the system should be powered by solar panels and the batteries should remain in standby mode.*
Charge Controller	✓ *Type:* Maximum Power Point Tracking (MPPT). ✓ *Rated Current:* >100A. ✓ *Input Voltage:* Compatible with 48V battery system. ✓ *Efficiency:* ≥ 90%. ✓ *MPPT Range:* 100-450V DC (*PV Input Voltage*). ✓ *Protection:* Overload, short-circuit, reverse polarity, over-temperature. ✓ *Communication Interface:* RS485 or Bluetooth/Wi-Fi for remote monitoring. ***Note:*** *Include a provision for the option to use an external generator for charging the batteries.*

Monitoring System	✓ *Type:* Integrated solar monitoring system. ✓ *Features:* Real-time data on power generation, battery status, load consumption, system alerts. ✓ *Communication Interface:* Wi-Fi, Ethernet, or GSM for remote monitoring. ✓ *User Interface:* Web-based or mobile app for monitoring and control. ✓ *Data Logging:* Historical data storage and analysis. ✓ *Compatibility:* Works with the inverter and charge controller.
Protection Devices	✓ *DC Disconnect Switch:* Rated for system voltage and current. ✓ *AC Disconnect Switch:* Rated for system voltage and current. ✓ *Surge Protection Device (SPD):* DC and AC sides, Type 2 or better. ✓ *Fuses and Circuit Breakers:* Appropriately rated for DC and AC circuits. ✓ *Earth/Grounding System:* Proper grounding rods and connections according to electrical standards in PNG.
Mounting Structure	✓ *Material:* Galvanized steel or aluminium alloy (anti-corrosion and weather-resistant). ✓ *Design:* Ground-mounted or roof-mounted (specify based on site conditions). ✓ *Tilt Angle:* Adjustable or fixed, optimized for site latitude. ✓ *Wind Load Capacity:* Designed to withstand local wind speeds (e.g., up to 150 km/h). ✓ *Warranty:* 5 years structural warranty.
Enclosures	✓ *Rack: Rack mounted equipment should be installed in appropriate enclosures or racks.*
Wiring and Cabling	✓ *DC Cables:* XLPE/PVC insulated copper cables, UV-resistant ✓ *AC Cables:* XLPE/PVC insulated copper cables, UV-resistant ✓ *Connectors:* MC4 connectors or equivalent, IP67/IP68 rated ✓ *Protection:* Cable management system (conduits, trays) for weatherproofing and mechanical protection

After-Sales Support	✓ *Technical Support:* Availability of technical support post-installation. ✓ *Service Agreement:* Option for annual maintenance service agreements.
Warranties and Certifications	✓ *Component Warranties:* Specify warranty periods for each component (panels, inverter, batteries, etc.). ✓ *Installation Warranty:* 1-2 years warranty on installation workmanship.

b) **Grid-Tie In Battery Energy Storage System:**

Component	Specifications
Grid-Tied Inverter	✓ *Type:* Pure Sine Wave Hybrid Inverter. ✓ *Power Rating:* Designed for continuous operation with capacity to handle surge loads. ✓ *Battery Input Voltage:* 48Vdc (compatible with *$LiFePO_4$* battery bank). ✓ *Grid Input:* 240Vac, single-phase, 50 Hz or 415Vac 3-phase. ✓ *Efficiency:* ≥ 95% conversion efficiency. ✓ *Battery Charging:* Integrated battery charger with selectable charging profiles (for different battery types). ✓ *Transfer Time:* ≤ 10 ms (seamless switch between grid and battery). ✓ *Protection:* Overload, short-circuit, over-temperature, over/under-voltage protection.
Battery Bank	✓ *Type:* Lithium Iron Phosphate (*$LiFePO_4$*). ✓ *System Voltage:* 48Vdc. ✓ *Days of Autonomy:* 2-3 days. ✓ *Cycle Life:* ≥ 3,000 cycles at 80% Depth of Discharge (*$LiFePO_4$*). ✓ *Depth of Discharge (DoD):* 80% (*$LiFePO_4$*). ✓ *Charge/Discharge Efficiency:* ≥ 90% (*$LiFePO_4$*).

	✓ *Operating Temperature Range:* 0°C to +60°C (charge), -20°C to +60°C (discharge). ✓ *Battery Management System (BMS):* Integrated BMS for *LiFePO₄* batteries. ✓ *Warranty:* 5-10 years (*LiFePO₄*).
Battery Management System	✓ *Features:* Real-time monitoring of battery voltage, current, temperature, and state of charge (SoC). ✓ *Protections:* Overcharge, over-discharge, thermal protection, short-circuit, and cell balancing. ✓ *Communication Interface:* RS485, CAN Bus, or Modbus for integration with the inverter and remote monitoring systems.
Battery Charger (Integrated in Inverter)	✓ *Type:* Multi-stage smart charger (bulk, absorption, float) ✓ *Charging Current:* >100A (programmable based on battery type and capacity). ✓ *Charging Voltage:* Compatible with 48V battery system. ✓ *Efficiency:* ≥ 90%. ✓ *Protections:* Overload, short-circuit, reverse polarity, over-temperature. ✓ *Communication Interface:* RS485 or Bluetooth/Wi-Fi for remote monitoring.
Automatic Transfer Switch (ATS)	✓ *Type:* 2-pole or 4-pole, depending on the system configuration ✓ *Rated Capacity:* ≥100A (or appropriately rated for the system load) ✓ *Switching Time:* ≤ 10 ms (fast switching between grid and battery backup) ✓ *Voltage Rating:* 240V/415V AC, single-phase/3-phase ✓ *Manual Override:* Available for maintenance and testing ✓ *Certifications:* CE, ISO, UL, IEC 60947-6-1 (or equivalent) ✓ *Warranty:* 2-3 years
Monitoring & Control System	✓ *Type:* Integrated monitoring system with a user-friendly interface. ✓ *Features:* Real-time data on grid status, battery levels, load consumption, and system alerts.

	✓ *Communication Interface:* Wi-Fi, Ethernet, or GSM for remote monitoring. ✓ *User Interface:* Web-based or mobile app for monitoring and control. ✓ *Data Logging:* Historical data storage and analysis. ✓ *Compatibility:* Compatible with the hybrid inverter and BMS.
Protection Devices	✓ *DC Disconnect Switch:* Rated for system voltage and current. ✓ *AC Disconnect Switch:* Rated for system voltage and current. ✓ *Surge Protection Device (SPD):* DC and AC sides, Type 2 or better with a response time of <25ns. ✓ *Fuses and Circuit Breakers:* Appropriately rated for DC and AC circuits. ✓ *Earth/Grounding System:* Proper grounding rods and connections according to local electrical codes.
Mounting Structure	✓ *Material:* Galvanized steel or aluminium alloy (anti-corrosion and weather-resistant). ✓ *Design:* Ground-mounted or roof-mounted (specify based on site conditions). ✓ *Tilt Angle:* Adjustable or fixed, optimized for site latitude. ✓ *Wind Load Capacity:* Designed to withstand local wind speeds (e.g., up to 150 km/h). ✓ *Warranty:* 5 years structural warranty.
Enclosures	✓ *Rack: Rack mounted equipment should be installed in appropriate enclosures or racks.*
Wiring and Cabling	✓ *DC Cables:* XLPE/PVC insulated copper cables, UV-resistant ✓ *AC Cables:* XLPE/PVC insulated copper cables, UV-resistant ✓ *Connectors:* MC4 connectors or equivalent, IP67/IP68 rated ✓ *Protection:* Cable management system (conduits, trays) for weatherproofing and mechanical protection
After-Sales Support	✓ *Technical Support:* Availability of technical support post-installation.

	✓ *Service Agreement:* Option for annual maintenance service agreements.
Warranties and Certifications	✓ *Component Warranties:* Specify warranty periods for each component (panels, inverter, batteries, etc.). ✓ *Installation Warranty:* 1-2 years warranty on installation workmanship.
Compliance	✓ The Grid-Tie In system must be certified and commissioned by a Licensed Electrician recognized by the National Energy Authority (NEA) and must fully comply with the regulations outlined in the National Energy Act 2021.