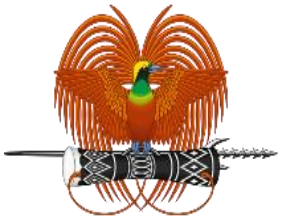

Government of Papua New Guinea
National Information and Communications Technology Authority

National Information and Communications Technology Authority

UNIVERSAL ACCESS AND SERVICE (UAS)

REQUEST FOR PROPOSALS (RFP)

CONNECT OUR SCHOOLS PROJECT (CSP) WITH EU STREIT

LOT 5

UAS24-RFP-CSPL5-BCSP-v1

PROVISION OF FIXED BROADBAND CONNECTIVITY & SOLAR POWER SYSTEMS

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

APRIL 2025

Contents

SUMMARY AND BACKGROUND

The National Information and Communications Technology Authority (NICTA), in partnership with the **International Telecommunication Union** (ITU) under the European Union **STREIT** (*Support to Rural Entrepreneurship, Investment & Trade*) PNG's Program in collaboration with the Food and Agriculture Organization (FAO), is seeking proposals from experienced and qualified Internet Service Providers (ISPs) and sustainable Power Systems providers. The objective is to supply and install fixed broadband internet connectivity, including Wi-Fi hotspots, powered by solar energy systems at designated resource centres located in selected schools (*refer **Annexure** A for list of schools*) across the East and West Sepik Provinces.

These resource centres are being established to support farmers in the cocoa, vanilla, and fisheries value chains as part of the digital transformation efforts under the STREIT Program. Reliable internet access will enable the training of farmers in digital skills, enhance their access to market information, and support the broader goals of improving productivity and sustainability in rural entrepreneurship. The Wi-Fi hotspots will serve both the resource centres and the surrounding communities, requiring robust outdoor coverage to ensure accessibility.

This Request for Proposals (RFP) seeks solutions that provide high-quality, reliable broadband connectivity to the resource centres, with an emphasis on sustainable solar energy systems designed to power the broadband infrastructure with a minimum autonomy of 2-3 days. The project will address the critical need for digital literacy and access to online tools and resources, empowering farmers to fully participate in the digital economy. The selected providers will contribute to fostering innovation, improving livelihoods, and promoting rural development in line with the goals of the STREIT Program.

1. PROPOSAL GUIDELINES

This RFP represents the requirements for an open and competitive process. All proposals must include a clear and concise response to each element outlined in this RFP. Proposals that fail to meet the requirements of the 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 **4:30 pm** on **22nd April 2025**. Any proposals received after this date will not be considered. Proposals should include a detailed breakdown of costs, a timeline for the project, and a demonstration of the bidder's ability to meet the project requirements. Bidders must submit their proposals electronically **ONLY** to uas@nicta.gov.pg. Any inquiries regarding the RFP should be directed to uas@nicta.gov.pg. Mr. Robert Griffin will oversee the project and facilitate communication.

2. PROJECT PURPOSE AND DESCRIPTION

Purpose:

The primary purpose of this RFP is to support the digital transformation of rural farmers in the cocoa, vanilla, and fisheries value chains by providing resource centres with the necessary infrastructure to access reliable, high-speed internet. This will enable farmers to engage in digital training, access market information, and enhance their digital literacy, ultimately improving their productivity and access to global markets.

Additionally, the project seeks to implement sustainable energy solutions by integrating solar power systems designed to provide adequate power to the broadband infrastructure, with a minimum autonomy of 2-3 days to ensure continuous operation during periods of low sunlight. By doing so, the project will empower rural communities with the tools needed to participate in the digital economy, support sustainable rural development, and enhance entrepreneurship in line with the goals of the STREIT Program.

Description:

The STREIT Program, funded through the European Union and supported by ITU in partnership with NICTA, aims to empower farmers in the cocoa, vanilla, and fisheries sectors of East and West Sepik Provinces by integrating technology into rural entrepreneurship. Each selected resource centre will be equipped with fixed broadband internet connectivity and Wi-Fi hotspots with enhanced outdoor coverage, powered by solar energy systems, ensuring continuous access to high-speed internet for both the resource centres and surrounding communities.

In collaboration with relevant stakeholders, this initiative seeks to improve the livelihoods of rural farmers by providing them with access to digital tools, training, and market information to enhance their productivity and sustainability. This RFP invites experienced ISPs and power system providers to submit proposals for implementing fixed broadband internet connectivity powered by sustainable solar energy systems at the designated resource centres. The successful implementation of this project will contribute to the overall digital transformation and economic growth in these rural areas.

All equipment provided through this project is intended for the exclusive use of the designated resource centres supporting farmers in the cocoa, vanilla, and fisheries sectors, with Wi-Fi hotspots extending access to surrounding communities. Upon completion of the project, each resource centre will assume full responsibility for the equipment, including its maintenance and operation, ensuring the continued functionality of the broadband connectivity and solar power systems.

3. PROJECT SCOPE

The project involves the following:

3.1 Fixed Broadband Connectivity

- **System Design:**
    - Provide a comprehensive design for fixed broadband internet connectivity tailored to the specific needs of the resource centres, ensuring robust and reliable WLAN infrastructure and hotspot Wi-Fi for wireless access across

the premises and surrounding communities. Outdoor Wi-Fi coverage must be optimized using high-gain sector antennas to extend range and signal strength.

- All design proposals must comply with the project requirements and specifications outlined in the RFP.

- **Supply and Installation of Equipment:**
  - Supply and install fixed broadband systems capable of providing reliable and high-speed internet connectivity to the resource centres.
  - Supply and install Wi-Fi access points, including outdoor units with high-gain sector antennas, to ensure coverage throughout the resource centre premises and surrounding areas.

- **Hotspot Wi-Fi Installation:**
  - Install and configure Wi-Fi hotspots in key areas within the school premises to provide wireless internet access to students and staff as well as the farmers in the surrounding communities.
  - Ensure outdoor Wi-Fi coverage extends up to 1-2 kilometres, leveraging high-gain sector antennas (e.g., 120° or 90° sector antennas with 14-20 dBi gain) to maximize range and signal quality.

- **Network Configuration:**
  - Configure the network to ensure secure and efficient access to internet resources.
  - Implement necessary security protocols to protect against unauthorized access.

- **Training and Support:**
  - Provide training to resource centre staff on the use and maintenance of the installed systems.
  - Offer ongoing technical support and maintenance services.

- **Monitoring and Reporting:**
  - Implement monitoring tools to provide regular reports on network performance and usage statistics.

3.2 Power Solution:

- **System Design:**
  - Provide a detailed electrical and mechanical design, including layout and wiring diagrams, for a solar power system capable of supporting the broadband infrastructure's total daily energy consumption of **10.6 kWh**, with a minimum autonomy of 2-3 days during periods of low sunlight. The design must ensure continuous operation of all broadband equipment.

- **Supply of Equipment:**
    - Provide all necessary components of the power system, including solar panels, inverters, batteries (sized for 2-3 days autonomy), mounting structures, remote monitoring systems, fuses, wiring, and any other required accessories.
- **Installation of Service:**
    - Professional installation of the power systems at identified schools, ensuring all safety and performance standards are met.
- **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 for a minimum of 2-3 days without sunlight.
- **Training and Support:**
    - Provide training for resource centre 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.
- **Monitoring and Reporting:**
    - Implement online-accessible monitoring tools to provide regular reports on power performance and usage statistics.

3.3 Logistics

- Arrange logistics to all project sites.

4. PROJECT TIMELINE

Request for Proposal Timeline:

All proposals are to be submitted by **4:30 pm on 22nd April 2025** via email **ONLY** to uas@nicta.gov.pg with the Subject ***Proposal for UAS24-RFP-CSPL5-BCSP-v1;***

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. Contract negotiation with the winning bidder will begin upon notification.

Notifications to unsuccessful bidders will be sent after the evaluation is complete.

Project Timeline:

The project timeline for the delivery and installation of services will commence upon the signing of the project agreement. Given the logistical and access challenges at all seven (7) sites, the timeline shall be a maximum of 6 months.

5. PROJECT MANAGEMENT AND COMMUNICATION

Regular communication and updates between NICTA and the successful supplier will be essential to ensure the project stays on schedule and meets its objectives. Mr. Robert Griffin from NICTA will oversee the project and facilitate communication.

6. PROJECT BUDGET

The project will be funded by NICTA through the UAS Fund. A project amount of **K420,000.00** *(GST incl)* has been set aside. Cost efficiency will be a key evaluation criterion.

7. BIDDERS QUALIFICATION

To qualify for consideration, bidders must meet the following criteria:

- For Fixed Broadband Connectivity: The bidder must be a NICTA licensee and hold all necessary licenses to operate as an ISP. Alternatively, an innovative entrepreneur may establish a Joint Venture (JV) with a licensed ISP.
- Demonstrated experience in providing fixed broadband internet services powered by sustainable power solutions in remote or challenging areas.
- Proven track record in managing and executing projects of similar scope or scale.
- Strong technical expertise and operation capacity to complete the project within the stipulated timeframe.
- Capability to provide ongoing technical support and maintenance.
- Compliance with all relevant regulatory requirements in PNG.
- Provide IPA Certificates to conduct business in PNG
- Provide TIN Certificate in accordance with tax regulations for business in PNG

8. PROPOSAL EVALUATION CRITERIA

Price will be a significant factor, but not the sole determinant. NICTA seeks suppliers delivering the best value for investment. Proposals will be evaluated based on:

- **Compliance:** Adherence to RFP requirements, standards, and regulations, including NEA certifications for power systems.
- **Technical Approach:** Quality and feasibility of the proposed solution.
- **Experience and Qualifications:** Bidder's experience, past performance, and team qualifications.
- **Cost-effectiveness:** Overall cost and value for money.
- **Project Timeline:** Delivery timeline and ability to meet project deadlines.
- **Support and Maintenance:** Capability to provide ongoing support.
- **Innovation and Value-Added Service:** Additional services or innovative approaches proposed.

9. CHANGE MANAGEMENT

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

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10. CONFIDENTIALITY

All information submitted in proposals will be treated as confidential.

ANNEXURE

A. PROJECT SITES

List of Resource Centres:

Name	Province	District	Budget	
			Fixed Broadband	*Power Systems*
Lumi Secondary School	West Sepik	Nuku-Lumi	K 50,000.00	K 90,000.00
Nuku Secondary School	West Sepik	Nuku-Lumi	K 50,000.00	K 90,000.00
Ossima Secondary School	West Sepik	Vanimo-Green	K 50,000.00	K 90,000.00

B. FIXED BROADBAND CONNECTIVITY TECHNICAL SPECIFICATIONS

The fixed broadband internet connectivity and network equipment must adhere to NICTA's technical specifications, ensuring compatibility and reliability for resource centres and surrounding communities.

1. Fixed Broadband Internet Connectivity

- **Bandwidth:** Minimum 10 Mbps download and 3 Mbps upload.
- **Latency:** < 600 ms.
- **Coverage:** Ensure complete coverage at each school.
- **Reliability:** 99.5% uptime to accommodate critical operations.
- **Subscription:** **24 months** broadband subscription

2. Network Equipment

i. FortiGate Firewall

- **Interfaces:** 2 Gigabit Ethernet ports for WAN, 5-10 Gigabit Ethernet LAN/DMZ/Management Ports.
- **Security Features:** IPS, Antivirus, Web Filtering, Application Control, Email Filtering and SSL Inspections.
- **QoS:** Bandwidth management and traffic prioritization.
- **Power Consumption:** Maximum of 50W to 100W depending on model and usage.

ii. Router

- **Ethernet Ports:** 5 to 10 Gigabit Ethernet ports.

- **Wireless Support:** Optional dual-band 2.4/5 GHz Wi-Fi (802.11b/g/n/ac).
- **USB Port:** USB 3.0 port for external storage or 3G/4G/LTE modem connectivity as a backup link.
- **QoS:** Quality of Service (QoS) capabilities to prioritize traffic and manage bandwidth effectively.
- **Power Supply:** 24V with Passive PoE (up to 57V).
- **Power Consumption:** Maximum of 20W to 30W depending on model and usage.

iii. Indoor and Outdoor Wireless Access Points

- **Frequency Band:** Dual-band (2.4 GHz and 5 GHz) for wider compatibility and better performance.
- **Data Rate:**
  - ✓ **Indoor**: Minimum 4.8 Gbps (5 GHz) and 450 Mbps (2.4 GHz).
  - ✓ **Outdoor**: Minimum 1.3 Gbps (5 GHz) and 400 Mbps (2.4 GHz).
- **Antenna Type:**
  - ✓ **Indoor**: Integrated high-gain omnidirectional antennas (2 dBi for 2.4 GHz, 5 dBi for 5 GHz).
  - ✓ **Outdoor**: High-gain sector antennas (e.g., 120° or 90° sectors, 14-20 dBi gain for 2.4 GHz and 5 GHz) to ensure extended coverage of 1-2 km.
- **Transmit Power:** Adjustable up to 30 dBm
- **Range:**
  - ✓ **Indoor**: 100m.
  - ✓ **Outdoor**: 1-2 km with sector antennas.
- **Ethernet Ports:** Gigabit Ethernet with PoE (Power over Ethernet) support.
- **Power Supply:** 48V Passive PoE or 802.3af/at compliant.
- **Weatherproofing:** IP67-rated for outdoor units.
- **Mounting Options:** Pole, wall, or tower mounting brackets included for flexible installation options.
- **MIMO Technology:** Support for 2x2 or 3x3 MIMO.
- **Management:** Cloud-based or centralized management platform with real-time monitoring, remote configuration, and firmware updates.
- **Standards:** IEEE 802.11ac/n/a/g/b.

iv. Rack Unit (RU):

- **Total Rack Units:** 18RU (Rack Units).
- **Height:** Approximately 31.5 inches (800.1 mm).
- **Width:** Standard 19 inches (482.6 mm) width to fit industry-standard equipment.
- **Depth:** Options ranging from 600 mm to 800 mm, depending on equipment size and cabling requirements.
- **Static Load Capacity:** Typically, up to 500 lbs (227 kg), depending on the model and mounting method.
- **Ventilation:** Perforated or vented top and side panels for passive cooling.
- **Grounding:** Pre-drilled grounding points with grommets for organised cable routing
- **Front Door:** Lockable front door (perforated or solid).
- **Side Panels:** Removable and lockable side panels for easy access while maintaining security.
- **Rear Door:** Optional or integrated rear door, usually with a locking mechanism.

v. Hotspot:

- **User Capacity:** Supporting at least 20-30 devices connected simultaneously without significant degradation in performance. Ability to manage traffic across connected devices to ensure optimal performance for all users for load balancing.
- **Security:** WPA3 Encryption.
- **Pricing and Plans:** Propose data bundles and pricing for Wi-Fi vouchers in consultation with schools.
- **Token Printer:** Thermal Receipt Printer with high-speed printing suitable for voucher printing.

C. POWER SYSTEM TECHNICAL SPECIFICATIONS

An off-grid solar power system is required to provide reliable and sustainable energy for the broadband infrastructure, with a total daily energy consumption of **10.6 kWh** and a minimum autonomy of 2-3 days. The system must operate entirely on solar power with battery storage to ensure continuous operation during low sunlight periods.

The proposed power systems must meet the following technical specifications:

i. Off-Grid Power System:

Component	Specifications
Solar Panels	✓ *Type:* Monocrystalline. ✓ *Total Capacity:* 5kW. ✓ *Efficiency:* ≥ 18% efficiency. ✓ *Operating Temperature Range:* -40°C to +85°C. ✓ *Warranty:* 25 years performance warranty, 10 years product warranty.
Inverter	✓ *Type:* Pure Sine Wave Hybrid Inverter. ✓ *Power Rating:* 3 kW continuous output, 5-7 kW peak output (for surge loads). ✓ *Battery Input Voltage:* 48Vdc (compatible with *$LiFePO_4$* battery bank). ✓ *Grid Input:* 240Vac, single-phase, 50 Hz. ✓ *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 *$LiFePO_4$* batteries. ✓ *Warranty:* 5-10 years (*$LiFePO_4$*).
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.
Charge Controller (Integrated in Inverter)	✓ *Type:* Maximum Power Point Tracking (MPPT) ✓ *Charging Current:* 60-100A (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 AC, single-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.
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.

ii. **Daily Load Profile:**

Load	Rating (W)	Quantity	Hours/day	Total Wattage (W)	Watt-Hours
Modem	90	1	24	90	2,160
Router (Mikrotik)	60	1	24	60	1,440
Fortinet	50	1	24	50	1,200
WAP Outdoor	100	1	24	100	2,400
QAP Indoor	50	2	24	100	2,400
Inverter	50	1	24	50	1,080
			Total	**450**	**10,680**