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 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

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Contents

SUMMARY AND BACKGROUND

National Information and Communications Technology Authority (*NICTA*) is seeking proposals from experienced and qualified Internet Service Providers (ISPs) and Power Systems providers to supply and install fixed broadband internet connectivity, including hotspot Wi-Fi, powered by sustainable power systems at designated schools participating in LOT 5 of '*Connect our Schools' Project* (CSP). This project recognizes the critical role that internet access plays in modern education to enhance educational opportunities.

The CSP is an initiative aimed at enhancing digital learning by providing reliable fixed broadband internet connectivity including hotspot Wi-Fi access powered by sustainable energy solutions to schools across the country. This project addresses the growing need for digital literacy and access to online educational resources, which are critical components of modern education to enhance learning activities.

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 **4:30pm on 28th August 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 CSP is to enhance the educational experience for schools by providing schools with the necessary infrastructure to access reliable high-speed internet access, thereby, enhancing the digital environment for students and teachers to engage in digital learning activities and improve their digital literacy. The project also aims to implement sustainable energy solutions by integrating sustainable power systems to ensure the continuous availability of broadband internet connectivity and hotspot Wi-Fi, which will support educational activities.

Description:

The CSP, funded by NICTA through the Universal Access and Service Fund, aims to enhance the learning environment in schools across Papua New Guinea by integrating technology into education. Each selected school will be equipped with the necessary infrastructure for fixed broadband internet connectivity powered by sustainable power systems to ensure there is continuous access to high-speed internet connectivity including 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 ISPs with the capability to also supply and implement sustainable power systems to submit proposals for implementing fixed broadband internet connectivity powered by a sustainable power system at the selected schools.

All equipment provided through this project is intended for the exclusive use of the recipient school. Upon project completion, the recipient school will assume full responsibility for the equipment, including its maintenance and operation.

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 schools, ensuring robust and reliable LAN infrastructure and hotspot Wi-Fi for wireless access across the campus.
  - 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.
  - Supply and install Wi-Fi access points to ensure coverage throughout the school premises.
- **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 surrounding communities.
  - Ensure coverage and signal strength is sufficient for all users.
- **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 school 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 all detailed electrical and mechanical design, including layout and wiring diagrams. Your design should be based on the total daily Energy Consumption rate of **10.6kWh**.
- **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.
- **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.
- **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.
- **Monitoring and Reporting:**
    - Implement monitoring tools accessed online to provide regular reports on power performance and usage statistics.

3.3 Additional Scope for Karkar Secondary School:

In addition to the existing scope, the following components are now included for **Karkar Secondary School**:

i. Point-to-Point Wireless Link to Miak Primary School

- Establish a reliable point-to-point wireless broadband link from **Karkar Secondary School** to **Miak Primary School**.
- Install appropriate outdoor wireless bridge equipment to ensure stable connectivity.

ii. Solar Power System Installation at Miak Primary School

- Design, supply, and install a **new solar power system** at Miak Primary School.
- The system must be adequately sized to:
  - Power the point-to-point link equipment.
  - Power both indoor and outdoor Wi-Fi systems at the primary school.

iii. Internet Infrastructure and Wi-Fi at Karkar Secondary School

- The core **internet infrastructure** (e.g., modem/router, firewall, switch) shall be installed at Karkar Secondary School.
- Deploy both **indoor and outdoor Wi-Fi systems** to ensure full school coverage.

iv. Upgrade of Existing Solar Power System at Karkar Secondary School

- Upgrade the existing **5kW solar power system** by:
  - Replacing current batteries with lithium-ion batteries of appropriate capacity.
  - Installing a **new inverter and battery charger** compatible with lithium batteries.
  - Ensuring the upgraded system is capable of supporting the enhanced internet infrastructure and Wi-Fi system reliably.

3.4 Logistics:

The successful bidder will be responsible for the end-to-end logistics and delivery of all equipment and materials to the designated schools. This includes:

- Packing, handling, and securing transportation of equipment (ICT, power, networking, etc.).
- Coordination of sea, air, and land freight (as applicable) to each school location.
- Delivery of equipment and materials to project sites, including first and last mile.
- Temporary storage and staging, if needed, before deployment.
- Coordination with local school authorities and NICTA for site access and delivery schedules.

4. PROJECT TIMELINE

Request for Proposal Timeline:

All proposals are to be submitted by **4:30pm on 28th August 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 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. All project sites present logistics and access challenges, therefore the timeline shall be a maximum of 3 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 **K360,000.00** *(GST incl.)* has been set aside for this project. Cost efficiency will be a key evaluation criterion.

7. BIDDERS QUALIFICATION

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

- For the Fixed Broadband Connectivity, the bidder must be a NICTA licensee and hold all necessary licenses to operate as an Internet Service Provider (ISP). Alternatively, an innovative entrepreneur may establish a Joint Venture (JV) with an existing licensed ISP that possesses the required NICTA licenses and operational permits, ensuring full compliance with regulatory requirements.
- 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 in our evaluation, but not the sole factor. We are looking for suppliers that deliver the best value with respect to investment. Proposals should demonstrate a clear understanding of project objectives 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 for the proposed power system.
- **Technical Approach:** The quality and feasibility of the technical solution proposed.
- **Experience and Qualifications:** The bidder's experience, past performance, and qualifications of their team.
- **Cost-effectiveness:** The overall cost and value for money.
- **Project Timeline:** Delivery timeline and ability to meet project deadlines.
- **Support and Maintenance:** The bidder's 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.

11. NICTA'S RIGHT TO ACCEPT ANY BID AND TO REJECT ANY OR ALL PROPOSALS

Notwithstanding any provision of this RFP, NICTA may decide at any stage prior to due execution by both parties of the Contract, to accept or reject any Proposal, or to cancel the RFP process, or reject or disqualify the Proposal of one or more or all proponents, without thereby incurring any liability to any proponent.

ANNEXURE

A. PROJECT SITES

List of Schools in **LOT 5**:

Name	Province	District	Budget		
			Fixed Broadband	*Power Systems*	*Logistics*
Karkar Secondary School	MADANG	Sumkar	K 65,000.00	K 130,000.00	K15,000.00
Telefomin Secondary	West Sepik	Telefomin	K 45,000.00	K 90,000.00	K15,000.00

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

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 fixed broadband internet connectivity.

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 ports for LAN, DMZ and Management Ports.
- **Security Features:** IPS, Antivirus, Web Filtering, Application Control, Email Filtering and SSL Inspections.
- **QoS:** Quality of Service (QoS) capabilities to prioritize traffic and manage bandwidth effectively.
- **Power Consumption:** Maximum of 50W to 100W depending on model and usage.

ii. Router

- **Ethernet Ports:** 5 to 10 Gigabit Ethernet ports for connecting the VSAT modem, access points, and other network devices.
- **Wireless Support:** Optional dual-band 2.4/5 GHz Wi-Fi (802.11b/g/n/ac) for local wireless connectivity.
- **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 input with support for 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 support (2.4 GHz and 5 GHz) for wider compatibility and better performance.
- **Data Rate:** Minimum of 1.3 Gbps (5 GHz) and 400 Mbps (2.4 GHz) for optimal throughput for outdoor WAP. Indoor WAP should have a minimum of 4.8 Gbps (5GHz) and 450 Mbps (2.4 GHz).
- **Antenna Type:** Integrated high-gain omnidirectional antennas.
- **Antenna Gain:** Minimum of 2dBi for 2.4GHz and 5dBi for 5GHz for indoor WAP. A Minimum of 8 dBi for 2.4 GHz and 14 dBi for 5 GHz for outdoor WAP.
- **Transmit Power:** Adjustable transmit power up to 30 dBm for extended range and penetration.
- **Range:** Capable of covering distances of 100m for indoor WAP and up to 1 kilometer for outdoor WAP, with potential for extended range using external antennas or repeaters.
- **Ethernet Ports:** Gigabit Ethernet ports with PoE (Power over Ethernet) support for easy installation and reduced cabling.
- **Power Supply:** 48V Passive PoE or 802.3af/at compliant PoE injector.
- **Weatherproofing:** IP67-rated enclosure for protection against harsh environmental conditions, including dust, rain, and extreme temperatures.
- **Mounting Options:** Pole, wall, or tower mounting brackets included for flexible installation options.

- **MIMO Technology:** Support for 2x2 or 3x3 MIMO for enhanced data throughput and improved signal quality.
- **Management:** Cloud-based or centralized management platform with real-time monitoring, remote configuration, and firmware updates.
- **Standards:** IEEE 802.11ac/n/a/g/b, compliant with international standards for wireless communication.

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:** Deploy the latest standard for Wi-Fi security such as WPA3 Encryption.
- **Pricing and Plans:** Setup data bundles and pricing for the Wi-Fi voucher for hotspot users. Consult schools to establish pricing.
- **Token Printer:** Thermal Receipt Printer with high-speed printing suitable for voucher printing.

C. POWER SYSTEM TECHNICAL SPECIFICATIONS

An off-grid solar power system will be deployed to meet the energy needs of all schools listed under LOT 5. Each school will be equipped with a 5kW standalone solar power system, designed to deliver reliable and sustainable electricity without dependence on the utility grid.

The system will operate solely on solar energy with battery storage to ensure uninterrupted power availability. During daylight hours, the solar panels will power the school's systems directly while simultaneously charging the batteries. The batteries will enter standby mode when fully charged and will automatically activate during low solar conditions—such as at night or on cloudy days—to provide backup power.

Battery management will be optimized to maintain longevity and efficiency, with discharge levels capped at 80% of total capacity before recharging begins. This configuration ensures a self-sufficient power supply at each site, capable of sustaining school operations even during extended periods of low sunlight.

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	Total Wattage	Hours/day	Watt-Hours
Modem	90	1	90	24	2,160
Router	60	1	60	24	1,440
Fortinet	100	1	100	24	2,400
WAP Outdoor	50	2	100	24	2,400
WAP Indoor	45	1	45	24	2,400
		Total	**445**		**10,680**