

ANNEB - TERMS OF REFERENCE

Institutional Contract

Title	Solarization of Schools Phase 2
Purpose	Supply and installation of solar power systems in 78 schools
Type of Contract	Institutional
Location	78 Schools located in Mwenezi, Masvingo, Gokwe North and Gokwe South Districts
Duration	6 Months
Estimated Start Date	January 2026
Reporting to	Education specialist

1. INTRODUCTION

The Ministry of Primary and Secondary Education (MoPSE), with support from its development partners, is implementing a school solarization programme targeting 78 schools across four districts—Masvingo, Mwenezi, Gokwe North, and Gokwe South. The initiative aims to improve the teaching and learning environment by providing reliable and sustainable energy solutions that enable the use of digital learning platforms and ICT equipment in schools.

Many schools in these districts currently face challenges related to inadequate or unreliable electricity supply, limiting their ability to effectively integrate technology into teaching and learning. Through solarization, schools will gain access to clean, renewable energy to power essential educational and administrative functions such as lighting, ICT laboratories, charging digital devices, and operation of school management systems.

This intervention aligns with the Ministry's efforts to promote digital and blended learning, enhance teacher productivity, and improve learner outcomes through increased access to digital resources. It also contributes to the Government of Zimbabwe's broader goals under the National Development Strategy 1 (NDS1) and Sustainable Development Goal 7 (Affordable and Clean Energy).

To date, 154 schools have been successfully solarized through this initiative in the phase 1, improving learning environments and supporting the implementation of digital education.

Building on the success of the first phase, the Ministry intends to support an additional 78 schools with the installation of solar power systems, ensuring inclusive access to energy for teaching, learning, and school administration. These systems will allow classroom lighting, device charging, ICT-enabled instruction, and improved staff working conditions.

2. OBJECTIVES

The objective of this engagement is to:

- Supply, install, and commission solar power systems at 78 schools, each capable of providing at least 10 kVA electrical output.
- Improve access to electricity for classrooms, staff rooms, and school offices to enable digital learning and enhance school operations.

3. SCOPE OF WORK

The contractor shall perform the following tasks at each of the 78 selected schools:

3.1 Site readiness assessment and associated report.

UNICEF has conducted site assessments for all the selected schools, and this is found in appendices A and B and detailed bill of quantities will be availed upon request. The site assessments focused on feasibility analysis of implementing the project, proposed layout of the system and bill of quantities among others. The prospective bidders are expected to also do a site assessment to check feasibility, completeness of the system layout plan and bill of quantities. Where there is some variance, the contractor must propose what is missing and the cost for each facility. The assessment should focus on a feasibility analysis for implementing the solar system.

3.2 Solar Power System Design and Installation

- Supply and install 10 kVA solar power system, including:
 - Ground-mounted solar photovoltaic (PV) array at least 2m above the ground (2m will be on the lower side of the array)
 - Hybrid inverter with MPPT charge controller (≥ 10 kVA)
 - Battery bank with a minimum usable storage capacity of 15 kWh (Lithium-ion)
 - Weatherproof enclosure for components
 - Surge protection, fuses, earthing, and safety mechanisms
 - Installation of a security fencing in case of ground mounting,
 - Installation and electrical connection of the solar modules,
 - Provision of all necessary fixtures, joints, fittings, cables and other items as required
 - Installation of grounding system and lightning protection
 - Installation of the enclosure/cabinet with the electrical and energy storage, including civil and mechanical works if needed this must be preferably installed inside a building.
 - Installation of external lights near the installed solar system components (panels and cabinet) for extended security during night-time,
- The system must support a daily load for lighting, fans, device charging, and ICT use.

3.3 Electrical Wiring and Power Points

- Wire and installation of electrical outlets in all classrooms, with at least three double sockets per room.
- Wire and provide power to one room per teacher (one light and a double socket), to support staff preparation, reading, or accommodation.
- Provide lighting, fans, and charging points in the staffroom and school head office.

3.4 Testing and Commissioning

- Conduct performance testing of each system after installation.
- Provide a full commissioning report with:
 - Load test results

- Panel and battery specs
- Inverter configuration
- User guidelines

3.5 Training and Handover

- Train school personnel and School Development Committee (SDC) members on:
 - Daily operations and safety
 - Routine maintenance (e.g., battery inspection, cleaning panels)
- Provide maintenance guide/manual and emergency contact information.
- The handover must include as-built diagrams, warranty documents, and training attendance lists.

4. TECHNICAL SPECIFICATIONS

4.1 Solar Modules

The proposed solar modules should comply with the following specifications:

Parameter	Value
Type	Monocrystalline / Bifacial
Efficiency	$\geq 20\%$ @STC
Capacity	≥ 550 Wp
Product warranty	≥ 10 years
Power warranty	1st year $\leq 2,5\%$ From year 2 to 25 $\leq 0,7\%$ per year
Power tolerance	Only positive
Max System voltage	≥ 1000 DC
Certification compliance	IEC 61215 & IEC 61730 IEC 61701 IEC 61716 PID proof
Temperature coefficient rated power	Lower than $-0.4\%/^{\circ}\text{C}$
Cables	4 mm ² , UV resistant
Connectors	MC4
J Box	IP66 or higher
Operation Temperature	$-30^{\circ}\text{C} \sim 70^{\circ}\text{C}$

PV Array considerations:

- The DC cables shall be selected and mounted in a way to withstand the external influences on site like temperature, UV irradiation, wind, sand and mechanical load.
- All string and main cables must be permanently labeled at both ends. The label shall inform at least about the corresponding inverter and string number, in case of need. All cables shall be fixed, and under no circumstances shall they bear any mechanical load on their terminations.
- PV DC connectors for string interconnection shall be of the same type as used by the PV module manufacturer. In no case connectors of different brands are to be

used in the same connection (male – female). Under no circumstances is it allowed to cut the PV module cables and to install anything other than the original connectors.

4.2 Inverters

The inverters shall be designed to be able to transmit the maximum output of the solar PV generator at all possible ambient temperatures and local conditions (e.g., soil, dust, atmosphere).

The chosen inverters shall have an input voltage range of 48V DC and above, and their AC output shall be compatible with the local grid at single-phase rated at 230V, 50/60Hz depending on the specific case. The inverter shall be equipped with an AC input option from the grid or a diesel generator.

Inverters shall meet the minimum technical requirements:

Parameter	Value
Minimum efficiency	$\geq 94\%$
Product warranty	≥ 10 years
Power factor control	0,8 leading to 0,8 lagging
AC output voltage	230 V (according to the local grid)
Harmonic distortion	$\leq 3\%$
Protections:	Short-circuit DC reverse polarity Overload – Overtemperature Over / Under Voltage
Standard compliance:	IEC 62109 – 1 – IEC 61000 IEC 61683

4.3 DC Charger & BMS

The minimum requirements for the battery charger are:

- MPPT control
- Able to communicate with external BMS
- Efficiency $\geq 95\%$
- Compatible with lithium-ion batteries
- Environmental protection according to the location and place where the controller will be installed.

To protect the battery, a battery management system (BMS) should be in place, as minimum requirement the BMS should incorporate:

- Voltage protection charge/discharge
- Temperature protection charge/discharge
- Battery cell balancing
- Disconnect load in case of cell undervoltage
- Replacement parts and spares readily available

4.4 Batteries

Parameter	Value
Type	Lithium base
Life	≥ 5000 cycles @ 90% DOD
Warranty	≥ 5 years
Self-discharge	< 2% per month (battery off)
Harmonic distortion	≤ 3%
Standard compliance:	IEC 62133 UL 1973 UL 38.3 IEC 62619 IEC 63056 IEC 62933

4.5 Mounting Structure requirements for ground mounting

The envisioned solution (and any civil works or foundations) must comply with all local norms and standards for structural design and calculation; besides the local standards, the structure should meet the requirements and loads caused by winds of 180 km/h.

The PV mounting support structure shall be designed with a tilt angle equal to the project location's latitude.

The PV panels should be clamped to structure only at the allowable points along the panel frame, which is specified by the panel manufacturer. Each panel should be clamped to the purlins using 4 clamps (2 clamps on each opposite side of the panel).

The structures should be designed to allow easy replacement of any module. The array structure should be so designed that it will occupy minimum space without sacrificing the output from the PV panels. Installation of solar structures should not damage the roof in any way. If any concrete or foundation is required, it should be a precast type.

The proposed ground mounted fixed structure should be constructed utilizing hot deep galvanized steel with a zinc coating thickness of 75 micro-meters (mk-m). As per industrial standards, corrosion in an extremely aggressive environment is about 2 mk-m/year, which gives a good 25-year corrosion warranty. The solar modules are to be fixed on the mounting structure under the manufacturer's specifications and recommendations.

4.6 Cabinet (enclosure for the power unit, battery, inverter, charge controller etc).

To reduce assembly and installation time on site, it is required that all the components linked to the power conversion and energy storage be contained in an electrical cabinet/enclosure suitable for this purpose. All the components such as inverters, charge controllers, batteries, switches, fuses, monitoring etc. should be connected and tested in a factory (supplier warehouse) where UNICEF could carry out inspections.

As minimum requirement, but not limited to, the enclosure should have:

- Enclosure is designed for outdoor use, and should provide protection against water (rain), dust, wind, etc. (NEMA Type 3 or IP protection ≥ 54)
- The material of the cabinet/enclosure should be steel, with UV resistant coating suitable for electrical use.
- Connected to the ground system
- Locking mechanism
- Active ventilation to ensure the efficient operation of the equipment without having negative consequences of height temperatures This must be preferably installed inside a building.

4.7 Protections

The systems design should consider the implementation of all the electrical protections to ensure the safety operation of the system, as a minimum but not limited to, the following protections will be required:

- Battery fuse
- Battery switch
- PV array switch
- AC (inverter) switch
- SPDs, both AC and DC

All the breakers, switches and fuses should comply with IEC 60947

4.8 DC Cables and connectors

The DC cables shall be selected and mounted in a way to withstand the external influences on site like temperature, UV irradiation, wind, sand and mechanical load.

Solar DC cables shall be double insulated type PV1-F or equivalent, with a temperature range -40°C to $+90^{\circ}\text{C}$. The circuit must be installed as close as possible in parallel to avoid induction loops

All string and main cables must be permanently labeled at both ends. The label shall inform at least about the corresponding inverter and string number. All cables shall be fixed, and under no circumstances shall bear any mechanical load on their terminations (strain relief where required).

The connectors for string interconnection shall be the same type as used by the PV module manufacturer. Under no circumstances is it allowed to cut the PV module cables and to install anything other than the original connectors. All DC connectors shall be IP65 or IP67 as per manufacturer.

4.9 AC and control cables

Low voltage AC power and control cables for the interconnection of the inverter and the electrical circuit of the health facility, shall be provided with all the required accessories for its reliable operation, including the installation of cable terminals and fixtures.

The cable to connect the inverters with the facility to be electrified should be XLPE insulated.

4.10 Monitoring System

The system should include a remote real-time monitoring system allowing us to follow the key performance parameters of the systems and identify any potential failure or malfunction.

The monitoring system should provide intuitive information about the power flow of the system, the status of the batteries, temperature, on-time energy demand, and supply among other key parameters that can be used for preventive or corrective maintenance. All this information should be displayed on a user-friendly dashboard.

The monitoring and communication (i.e., 3G routers) hardware should be considered as part of the entire system. As described in Section 10, communication costs, software, and licenses must be considered under the scope of the operation and maintenance services for the relevant period.

There should also be a provision of extra routers to boost connection to allow remote monitoring of communication at locations where 2G/3G networks are weak. These routers will be quoted separately.

4.11 Combiner boxes

The proposed boxes shall comply with the following characteristics:

- IP-55 as minimum
- UV resistant
- IK8, BS EN 62262-22002 Certified
- Rubber gasket

4.12 Installation

The supplier or its local subcontractor is responsible for complying with required administrative procedures and securing prescribed permits and licenses to execute the work in connection with the solar system installation.

In the case of the mounting structure, the supplier must comply with all the standards and technical recommendations for civil, structural and seismic design of the destination country and provide all the services and materials related to civil, mechanical, and electrical works. The mounting structure and the solar modules should be connected to the ground system.

In the case of ground mounted structure, the supplier must consider the installation of a security fence, the material for poles, fence and its structure should be galvanized steel. It should be at least 2m height and complemented with two straight lines of razor wire on top. The fence should be placed to avoid potential shades on the solar modules during the year, and the service life of the security should match the service life of the entire system.

The AC cable connecting the solar system with the facility should be XLPE insulated and must be installed to withstand environmental conditions (wind, humidity, UV etc.) of destination, the preference should be installed in a trench of at least 80 cm of depth with a sand base layer and covered by a layer of material that ensure the mechanical protection of the cable.

As a general principle, the system should be designed for a minimum service life of 10 years. The installation procedures and material used for installing solar systems should comply with the destination country's regulations. The installation should be carried out by qualified

personnel hired in compliance with local regulations; suppliers are responsible for the security of the personnel and the provision of tools and security safety elements for this purpose.

All the material and components used for the installation should be new; the installation protocols and test should comply with the recommendations of the equipment manufacturers.

4.13 Wiring and lighting

The facility's wiring should be done in strict compliance with the norms and standards of the country where it is located and with the industry's best practices.

If the facility is composed of more than one building “block”, a switchboard and a main breaker per facility should be considered. Independent circuits for lighting and power (sockets) are mandatory. The entire internal electrical system must have a minimum protection rate of IP44. The internal cabling must run in proper ducting (conduits, fire resistant and halogen free should be observed) systems in compliance with current safety installation standards and best practices.

All the electric boxes, with their breakers, switches, fuses and all the electric distribution boards (AC and DC), and all the system components should be clearly identified and labelled.

4.14 Earthing and lightning protection

The earthing system shall be designed according to the following standards:

- IEC 60364 (4-41) Low-voltage electrical installations: Protection for safety - Protection against electric shock.
- IEC 60364(5-54) Low-voltage electrical installations: Selection and erection of electrical equipment – Earthing arrangements and protective conductors.
- IEC 61936-1 Power installations exceeding 1 kV A.C. - Common rules.
- EN 50522 Earthing power installations exceeding 1 kV A.C.
- IEC 60364–717 Low-voltage electrical installations: Requirements for special installations or locations – Mobile or transportable units.

The resistance of the grounding system shall not exceed 1 ohm. After installation of the earthing and lightning protection system, but before connection to adjacent earthing grids, measurement of earth resistance and other safety features of the earthing design shall be carried out.

Lightning and overvoltage concept as per international standards: A lightning and overvoltage concept shall be designed according to the IEC 62305 (all parts). PV System shall be equipped with Lightning Protection System (LPS) type I according to the IEC 62305. If the result of risk assessment (according to the IEC 62305-2) proposes is different, LPS class than this is also acceptable.

4.15 Operation and maintenance

The pricing should include daily system operation during the first two years after commissioning and acceptance. The operation and control of the system should not be limited to the registration of data but should comprise functions for assessment and interpretation of operating conditions in particular in order to allow for remote diagnosis of errors.

The proposal should include preventive maintenance activities including but not limited to:

- Module cleaning and inspection (2 times per year)
- Inverters (according to manufacturer guidance)
- Junction boxes and cabling (torque check once per year, fuses quarterly)
- Mounting structure
- Annual IV-curve measurement and thermographic (IR) checks for identification of underperformance and/or hot spots (annually)
- Maintenance of the Project Site (vegetation control and fencing if there are)

During the period of guarantee of operation of the PV System (24 months after commissioning), the service provider is required to offer full corrective maintenance at no extra cost for UNICEF. Corrective maintenance means the repair or replacement of defective materials and components. Corrective maintenance activities shall be initiated as soon as a failure is detected. It shall always be ensured that the staff of UNICEF are present and trained during each corrective maintenance activity.

5. PAYMENT TERMS

- Payments will be made upon satisfactory completion and certification of each site.
- The vendor must submit all invoices no later than **7 days after contract completion**.
- Invoices will be settled within **30 days of submission**.
- Please note **financial penalties may apply** if the agreed workplan is not followed, in accordance with UNICEF's terms outlined in the RFP document.

6. Expected background and Experience

- Complete and sign a Supplier Profile Form available from UNICEF offices.
- Submit certificate of incorporation as business concern duly registered to conduct Do business in Zimbabwe.
- Demonstrate that the company has a minimum of five years' experience in the
- supply, installation, training and other after-sales support of solar power installations
- Prepared to accept UNICEF's General Terms and Conditions
- Provide at least three references for similar major assignments undertaken during the last 5 years including name of project, location, name and contact details (email and telephone) of the client, implementation period and scope of services

7. Reporting

- The vendor will be reporting to the Education Specialist and to the Procurement Associate at UNICEF.

- Monthly meetings will be held regularly to update on progress.

8. Evaluation Criteria

Mandatory Pass/Fail Criteria

These are non-negotiable requirements. Failure to meet any results in automatic disqualification:

1. Legal & Regulatory Compliance

- Complete and sign a Supplier Profile Form available from UNICEF offices.
- Submit certificate of incorporation as business concern duly registered to conduct business in Zimbabwe.
- Documented evidence that the company maintains valid health insurance coverage for all personnel assigned to the project. This includes coverage for medical treatment and occupational health risks during the execution of works. The company will also be required to sign a Health and Safety Compliance Statement prior to commencement of the assignment
- Valid **company registration** and certificate of incorporation.
- Current **tax clearance certificate** (ITF263) from ZIMRA.

2. Licensing & Certification

- Valid license from **Ministry of Energy and Power Development** for solar services.
- Certification or accreditation from **Zimbabwe Energy Regulatory Authority (ZERA)** for solar PV installation. [\[zera.co.zw\]](http://zera.co.zw)

3. Financial Standing

- Submission of **audited financial statements** for the past 3 years.
 - Proof of financial capacity to execute the contract.
- The bidders should submit both technical and financial proposals separately.
 - Technical evaluation will consider the best proposed solarization solution, the bidder's capacity to deliver the services, compliance and submission of all required documentation.
 - Financial evaluation will consider the lowest cost to specification.

CATEGORY	MAXIMUM POINTS
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Technical Evaluation	
1. Experience as a contractor delivering similar goods and services, a) Minimum five years' experience in the supply, installation and other after-sales support of solar power installations for off-grid communities, (proof required) (3) b) Experience providing similar services on full time basis to other organisations or / international organisations /or United Nations Agencies (7) c) Providing a list of the last two projects of a similar nature with email and telephone information of the clients. (2) d) At least four positive reference checks for similar contracts done in the past three years (5) e) Capacity to reliably mobilize materials for installation. Contractors to indicate what is procured locally and offshore. In the case of offshore should indicate importation timelines. Additionally, they should indicate what they have in stock (subject to inspection/ verification by UNICEF) (3)	(20)
2. Detailed Methodology, Work Plan, Personnel, Equipment and Quality Control Measures to be used. a) Detailed sequential programme of activities from dispatch of equipment to the achievement of set tasks in order to complete the contract within the stated timeline. (Workplan should be presented by week for the first three months of the contract and monthly (thereafter) (8) b) Detailed list of personnel proposed for the execution of the contract, including the CVs and profiles of the key technical project personnel that will be assigned to the task and identification of personnel status. e. full-time staff, contractors, intermittent staff, etc.). (7) c) Detailed list of full-time technical expert staff employed by the bidder including name, position, area of expertise and years of experience. (3) d) Detailed list of equipment that comes with the solution. The information provided should include brand and specifications for all equipment. Do not state prices here. (7) e) Detailed information on warranty and guaranty provisions indicating periods and processes to be followed in the event of a claim (5)	(30)
3. Overall response: - Provision of Audited Financial Reports for the past 3 years. (8) - Summary of contract values for the past 3 years; (3) - and responsiveness to UNICEF requirements. (3) - Understanding of scope, objectives and completeness of response (3) - Overall concord between UNICEF requirements and the proposal, including the bidder's demonstration of financial capability to execute the contract (3)	(20)
Total Technical evaluation	70

Financial Evaluation	
CATEGORY	MAXIMUM POINTS
- PRICE	(30)
TOTAL MARKS	(100)

Technical Proposal (s) scoring 70 % (=Score of 49) or more following Proposal Evaluation will be shortlisted and included for review of Analysis and Evaluation on The Financial Offer

The **Technical Proposal** has a total evaluation value of **70** points. **Technical Proposals receiving 49** points or higher will be considered technically compliant to be pre-qualified to carry out verifications. Technical proposals that score 49 points higher will have their financial proposals evaluated. Proposals not considered technically compliant and nonresponsive will not be given further consideration.

The total number of points allocated for the **Financial Proposal** is **30**. The maximum number of points will be allotted to the lowest price proposal opened and compared among those invited firms/ institutions which obtain the threshold points in the technical component evaluation. All other price proposals will receive points in inverse proportion to the lowest price, e.g.,:

$$\text{Score for "Price proposal X"} = \frac{30 * \text{Price of lowest priced proposal}}{\text{Price of proposal X"}}$$

Total Technical and Price: 100 Points

Technical and financial proposals will be evaluated separately. Each proposal will be assessed first on its technical merits and subsequently on its financial component. The technically compliant proposal with the lowest acceptable financial offer that represents the best value for money and serves the best interest of UNICEF will be recommended for the contract award.

9. RISK MANAGEMENT

- The supplier will ensure that they have adequate resources, equipment, and third-party service agents required to complete the contract within the agreed timelines. ***Note that a duty-free certificate would be provided for the waiver of customs duty if the equipment is to be imported into Zimbabwe from regional or international markets***
- If the supplier is an international firm, it must have demonstrated local representation based in Zimbabwe.
- UNICEF will not be liable for any loss of value in the agreed price due to economic shocks or indeed any other factors after signing the contract. The contract will be raised in USD to mitigate some of the economic shocks.

- UNICEF will not be liable for any accidents in transit against this contract. The vendor will be responsible for the provision of adequate insurance coverage for the equipment, all its staff, and related third parties.

10. Policy both parties should be aware of:

- Members of the contracting company are not entitled to payment of overtime. All remuneration must be within the contract agreement.
- No contract may commence unless the contract is signed by both UNICEF and the Contractor.
- Members of the contracting company will not have supervisory responsibilities or authority on the UNICEF budget.
- Contracting companies will be required to sign the health statement for staff prior to taking up the assignment, and to document that they have appropriate health insurance.

Protection from Sexual Exploitation and Abuse (PSEA)

The Contractor shall uphold the highest standards of conduct and shall take all appropriate measures to prevent Sexual Exploitation and Abuse (SEA).

The Contractor agrees to:

- Comply with the UNICEF policy on Protection from Sexual Exploitation and Abuse (PSEA).
- Ensure that all personnel, subcontractors, and affiliates are trained or are aware of the PSEA principles.
- Establish confidential and accessible mechanisms for reporting SEA incidents.
- Cooperate fully with UNICEF in the investigation and resolution of any SEA allegations.
- Take immediate disciplinary action against any personnel found to have engaged in the SEA.

Child Safeguarding

The Contractor shall ensure that its operations do not expose children to harm, abuse, neglect, or exploitation. The Contractor agrees to:

- Implement child safeguarding policies and procedures aligned with UNICEF's standards.
- Vet, train or awareness to all personnel who may contact children.
- Report any safeguarding concerns or incidents to UNICEF within 24 hours.
- Cooperate with UNICEF in any safeguarding investigations.
- Take corrective actions to prevent recurrence of any safeguarding breaches.

Breach and Termination

Any breach of the above obligations shall be considered a material breach of contract and may result in immediate termination of the agreement, without prejudice to any other rights or remedies available to UNICEF.

11. General Conditions: Procedures and Logistics

Policy for Both Parties

- The contract must be signed by both UNICEF and the Contractor before any work begins.
- No travel by any member of the contracting company is permitted prior to contract signature.
- All costs related to travel and the assignment are the responsibility of the UNICEF Zimbabwe Country Office requesting section.
- Members of the contracting company will not have supervisory authority or control over UNICEF's budget.

Google locations

[Locations of schools Mwenezi Gokwe South Gokwe North Masvingo for solarisation phase 2.docx](#)

Site Maps

[Cable Routing Spatial Layout all Districts.docx](#)