

TERMS OF REFERENCE (TOR)

SOLARIZATION OF SOS CHILDREN'S VILLAGES HARGEISA COMPOUND (PROCUREMENT, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF A 42.9 kWp / 144 kWh (*42.9 kWp solar PV capacity and 144 kWh battery storage capacity*) HYBRID SOLAR PV SYSTEM AT SOS CHILDREN'S VILLAGES HARGEISA COMPOUND)

1. Introduction

SOS Children's Villages is an international non-governmental organization (NGO), founded in Austria in 1949 and operating in more than 136 countries and territories worldwide. The organization is committed to the care, protection, and development of children and young people who have lost parental care or are at risk of losing it, while also strengthening families and communities to prevent child abandonment and social neglect.

SOS Children's Villages Somaliland is committed to improving the sustainability, efficiency, reliability, and cost-effectiveness of its operations. As part of this commitment, SOS Children's Villages Somaliland intends to transition a significant portion of its Hargeisa compound's electricity supply from conventional/grid and diesel-based generation toward a hybrid solar photovoltaic (PV) energy system.

SOS Children's Villages Somaliland therefore invites qualified and experienced solar energy companies/contractors to submit proposals for the supply, installation, testing, commissioning, and handover of a hybrid solar PV system at the SOS Children's Villages Hargeisa Compound.

2. Background

SOS Children's Villages Hargeisa Compound consists of residential family houses and various administrative, community, and service facilities. The compound has a combined residential and office electricity load, with residential facilities contributing significantly to evening and night-time demand and administrative facilities contributing to daytime consumption.

A detailed solar PV system design and load assessment has been prepared based primarily on field-measured electricity consumption data. The design report indicates an average daily energy consumption of approximately 123 kWh/day, a baseline daily energy consumption of 137 kWh/day, a measured peak demand of approximately 15 kW over five minutes, and a measured short-duration peak of approximately 22 kW.

The design specifies that the 66 PV modules are distributed equally across three rooftops, with 22 modules on each of the Store Building, House 5 Building and Workshop Building.

The design further specifies the 42.9 kWp PV system, 40 kW three-phase hybrid inverter, 144 kWh LiFePO4 battery capacity, 415 V AC three-phase four-wire output, and 50 Hz operating frequency.

3. Purpose of the Assignment

The purpose of this assignment is to select a qualified and experienced solar energy company to supply, install, test, commission, and hand over a complete hybrid solar PV system for the SOS Children's Villages Hargeisa Compound in accordance with the approved design, BOQ, technical specifications, and applicable standards.

4. Objectives

The specific objectives are to:

- Supply and install complete hybrid solar PV system (42.9 kWp hybrid solar PV system with approximately 144 kWh of battery energy storage capacity) at the SOS Children's Villages Hargeisa Compound
- Install and integrate the 40 kW three-phase hybrid inverter with the existing electrical system
- Reduce dependence on grid and diesel-generated electricity.
- Provide a reliable and sustainable source of electricity for the SOS Hargeisa Compound.
- Install an appropriately sized battery energy storage system.
- Integrate the solar PV system with the existing engineer/electrical/grid system.
- Ensure safe, reliable, efficient, and properly protected operation of the complete system.
- Test, commission, and hand over a fully functional system.
- Provide training, operation and maintenance documentation, warranties, and after-sales technical support.

5. Scope of Work

The selected contractor shall be responsible for the complete procurement, supply, delivery, installation, testing, commissioning, training, and handover of a 42.9 kWp hybrid solar PV system with approximately 144 kWh battery energy storage at the SOS Children's Villages Hargeisa Compound. The scope includes the supply and installation of solar PV modules and mounting structures, hybrid inverter, battery storage system, DC and AC cabling, electrical protection and distribution equipment, earthing and related safety systems, power-room requirements, and all necessary accessories and supporting works. The contractor shall also integrate the solar system with the existing electrical and grid infrastructure, conduct all required testing and commissioning, rectify any defects identified during implementation,

provide technical documentation and training to designated SOS staff, and hand over a fully operational system in accordance with the approved design, BOQ, technical specifications, applicable standards, and the requirements of SOS Children's Villages Somaliland.

The scope shall include, but not necessarily be limited to, the following:

5.1 Site Preparation and Mobilization

The contractor shall:

- Site clearing
- Mobilize personnel, equipment, tools, and materials required for the works.
- Inspect and confirm the installation locations before commencement.
- Prepare the installation sites.
- Protect existing buildings, electrical infrastructure, and other SOS assets during installation.
- Remove and properly dispose of installation waste and debris upon completion.

5.2 Supply and Installation of Solar PV Modules

The contractor shall supply and install:

- 66 solar PV modules of 650 W each, providing approximately 42.9 kWp total installed capacity.
- PV modules with efficiency greater than 21%.
- PV modules with a minimum 25-year product/performance warranty, as specified in the BOQ.
- The PV array shall be configured as six strings, with 11 modules connected in series per string.
- All required connectors, cables, mounting components, fasteners, and accessories.

The contractor shall ensure that all modules are properly aligned, securely mounted, electrically connected, and protected against environmental and mechanical risks.

5.3 PV Mounting Structures

The contractor shall supply and install complete roof-mounted PV mounting structures.

The mounting system shall:

- Be suitable for the existing roof structures.
- Be manufactured from structural-grade anodized aluminium or approved equivalent.
- Be corrosion resistant.
- Be fully compatible with the selected PV modules and roof structures.
- Be engineered to withstand a minimum design wind speed of 60 m/s (216 km/h).

- Have a minimum design service life of 25 years.
- Include all required structural components, fasteners, brackets, clamps, and accessories.

The contractor shall provide relevant structural calculations and installation documentation as required in the BOQ.

5.4 Hybrid Inverter

The contractor shall supply and install:

One 40 kW, three-phase high-voltage hybrid inverter with the following minimum requirements:

- Rated capacity: 40 kW.
- Three-phase, four-wire AC output.
- Compatible with 415 V AC, 50 Hz electrical system.
- Capable of operating with and without grid connection.
- 100% unbalanced three-phase output capability.
- Minimum MPPT voltage range: 150–850 V.
- Maximum input current: 40 A.
- Maximum short-circuit current: 60 A.
- Minimum three MPPTs.
- Each MPPT capable of accepting two strings.
- Six PV strings in total.
- Battery voltage range: 150–800 V.
- Minimum five-year warranty.

contractor shall submit manufacturer datasheets and technical documentation for the proposed inverter.

5.5 Battery Energy Storage System

The contractor shall supply and install a total battery storage capacity of approximately **144 kWh**, consisting of:

- Nine (9) battery units of approximately 16 kWh each.
- Lithium/LiFePO4 battery technology as specified in the design.
- Compatible high-voltage battery system and inverter.
- Required battery interconnection cables.
- Battery racks.
- High-voltage control box.
- Battery protection and monitoring equipment.

- All necessary accessories and connections.

The minimum battery warranty shall be 10 years, as specified in the BOQ.

5.6 DC and AC Cabling

The contractor shall supply and install all required DC and AC cables, including:

- 4 mm² solar PV DC cables, red and black.
- 35 mm² battery DC cables where required.
- 4 × 25 mm² copper AC cables between the inverter, grid, and load/distribution system.
- All cable glands, lugs, connectors, conduits, supports, clips, labels, and accessories.
- UV-resistant and weather-resistant cables for exposed PV installations.

Cable sizing, routing, termination, and protection shall comply with the approved design and applicable electrical standards.

5.7 DC Combiner, Protection and Safety Equipment

The contractor shall supply and install a complete DC PV protection system, including:

- DC PV string combiner/isolator box.
- Six inputs/six outputs.
- Appropriately rated string fuses.
- DC surge protection devices (SPD).
- DC isolators.
- MC4 connectors.
- All necessary protection and switching accessories.

The BOQ specifies 1,000 V-rated DC equipment and 20 A string fuses or suitable ratings based on the system voltage and current.

5.8 AC Distribution and Protection

The contractor shall supply and install:

- Four-pole 63 A circuit breakers.
- Metal distribution boards as specified in the BOQ.
- One three-phase 250 A, 415 V changeover switch.
- AC cables between the inverter, grid, and load.
- Required AC protection, isolation, and switching equipment.
- All associated boxes, glands, lugs, connectors, and accessories.

5.9 Earthing and Lightning Protection

The contractor shall install a complete PV system earthing and bonding system, including:

- Earth electrodes/rods.
- Earth conductors.
- PV module bonding.
- Mounting structure bonding.
- Equipment protective earth conductors.
- Earth bars.
- Clamps, lugs, test links, and inspection chambers.
- All other required earthing and bonding accessories.

The system shall be tested and certified before commissioning.

5.10 Conduits and Cable Management

The contractor shall provide and install:

- 25 mm orange conduit as specified in the BOQ.
- 2-inch UPVC conduit.
- UPVC sockets.
- UPVC elbows.
- UPVC T-sections.
- Cable trays/supports and other cable-management accessories where required.

All cables shall be properly routed, protected, labelled, and secured.

5.11 Power Room Requirements

The contractor shall supply and install the specified air-conditioning system for the power room, including:

- One 2-ton (24,000 BTU/h) dual-inverter split air conditioner.
- 25 A double-pole circuit breaker.
- Approximately 25 m of 2-core power cable.
- All necessary installation accessories.

6. Existing Electrical System Integration

The contractor shall integrate the solar PV system with the existing electrical infrastructure of the SOS Hargeisa Compound. The SOS Hargeisa Compound has an existing generator, and the solar PV system shall be fully integrated with the generator to ensure safe and coordinated operation between the solar PV system, battery storage, grid supply, and generator.

The contractor shall provide all necessary control, protection, changeover, synchronisation, and related equipment required for safe and reliable operation.

The contractor shall:

- Verify the existing electrical distribution system before installation.
- Coordinate with SOS and the appointed technical solar consultant.
- Ensure compatibility between the solar inverter, existing distribution system, grid supply, and backup generation where applicable.
- Carry out necessary distribution modifications identified in the approved design.
- Ensure proper phase loading and protection.
- Ensure that all electrical connections are safe and properly labelled.

The design assessment identified some phase imbalance, with L2 carrying a peak of approximately 8 kVA. The design recommends the use of a hybrid inverter capable of 100% unbalanced output.

7. Testing and Commissioning

The contractor shall conduct comprehensive testing and commissioning of the complete system, including but not limited to:

- PV module testing.
- String voltage and current testing.
- Insulation resistance testing.
- Continuity testing.
- Earthing resistance testing.
- DC and AC protection testing.
- Inverter functionality testing.
- Battery functionality and communication testing.
- Grid synchronization testing.
- Changeover functionality testing.
- Load testing.
- Monitoring and communication system testing.
- System performance verification.
- Safety and emergency shutdown testing.

The contractor shall submit commissioning and test reports to SOS Children's Villages before final acceptance.

8. Performance and Acceptance

The installed system shall:

- Operate safely and reliably.
- Comply with the approved technical design and BOQ.
- Meet the manufacturer's specifications.
- Meet applicable electrical and safety standards.
- Demonstrate proper integration with the existing SOS electrical system.
- Demonstrate correct charging and discharging of the battery system.
- Demonstrate correct operation under solar, battery, and grid conditions.
- Have all protection and safety systems fully operational.

Final acceptance shall be subject to successful testing, commissioning, inspection, and approval by SOS Children's Villages and/or its appointed technical consultant.

9. Coordination and Technical Supervision

SOS Children's Villages Somaliland has engaged a technical consultant for the solarization project.

The selected solar company shall work closely with the consultant throughout implementation. The consultant will provide technical oversight and supervision of the installation to ensure that the solar company implements the works according to the approved design, BOQ, technical specifications, quality requirements, and safety standards.

The contractor shall:

- Cooperate fully with the supervising consultant.
- Provide access to all relevant technical documentation.
- Obtain approval for significant technical changes before implementation.
- Rectify defects and non-conformities identified during supervision.
- Participate in technical review and progress meetings.
- Provide all documentation required for inspection and acceptance.

10. Documentation and Handover

Upon completion, the contractor shall provide a complete handover package including:

- As-built drawings.
- Final single-line diagram.
- Final PV layout.
- Equipment datasheets.

- Manufacturer manuals.
- Warranty certificates.
- Serial numbers and equipment schedules.
- Test and commissioning reports.
- Earthing test results.
- Inverter configuration/settings.
- Battery configuration and operating parameters.
- Operation and Maintenance (O&M) manual.
- Preventive maintenance schedule.
- Troubleshooting guide.
- Recommended spare parts list.
- Training records.
- Final completion report.

11. Training

The contractor shall provide practical training to designated SOS staff on:

- System operation.
- Monitoring of PV generation.
- Battery operation.
- Inverter operation.
- Grid/solar operating modes.
- Basic troubleshooting.
- Safety procedures.
- Routine inspection and maintenance.
- Emergency shutdown procedures.

12. Warranty and after-sales support

The contractor shall provide warranties in accordance with the BOQ and manufacturer requirements, including at minimum:

The contractor shall provide warranties in accordance with the BOQ, approved technical specifications, and manufacturer requirements, including at minimum:

- PV modules: 42.9 kWp total capacity (66×650 W), with a 25-year warranty.
- Hybrid inverter: 40 kW, three-phase hybrid inverter, with 100% unbalanced output capability, with a 5-year warranty.

- Battery energy storage system: 144 kWh total capacity, high-voltage LiFePO₄ (Lithium Iron Phosphate) battery system, with a 10-year warranty.
- High-voltage control box: 144 kWh system-compatible high-voltage control box, with a 5-year warranty.
- Battery racks: Heavy-duty battery racks suitable for the 144-kWh battery system, with a 10-year warranty
- Other equipment: manufacturer's warranty as specified in the BOQ.

The contractor shall provide after-sales technical support during the warranty period and shall respond promptly to reported system faults.

13. Safeguarding

Our organisation has zero tolerance for abuse, neglect, exploitation, sexual exploitation and abuse (SEA), harassment, discrimination, and misconduct. Safeguarding is a mandatory requirement for all staff, consultants, contractors, suppliers, partners, and service providers.

All successful applicants and contracted parties must comply with our Child and Youth Safeguarding Policy, PSHEA standards, and Code of Conduct and are subject to appropriate safeguarding screening and due diligence. Any safeguarding violation or misconduct may result in withdrawal of an offer or termination of the contract, in accordance with applicable policies and laws.

14. Contractor qualifications and eligibility

Interested companies should meet the following minimum requirements:

- Valid Somaliland government license from the Ministry of Energy and Minerals.
- Valid tax clearance certificate from the ministry of finance.
- At least five years of relevant experience in solar PV installation and electrical works and experience with three-phase hybrid solar systems
- Proven financial and technical capacity to complete the assignment (Company bank statement- one year from October 2025 to October 2026 and it should be original.)
- Demonstrated experience with projects of similar size and complexity and share similar works conducted (at least three contract and reports, for similar work conducted)
- Qualified and experienced electrical/solar engineers and technicians. (CV of one solar engineer with minimum of degree solar energy and one electric engineer with a minimum of degree of electric
- Contact information for at least three professional references .
- Demonstrated experience in installation of battery energy storage systems.

- Ability to provide warranty and after-sales technical support.

15. Bid Submission Requirements

Interested companies shall submit a complete technical and financial proposal containing:

A. Technical Proposal

- Company profile.
- Valid company registration/license.
- Relevant experience and references.
- List of similar completed projects. (at least three projects)
- Proposed technical approach and methodology.
- Proposed implementation schedule/work plan.
- Technical specifications and datasheets for major equipment.
- PV module datasheet.
- Hybrid inverter datasheet.
- Battery datasheet.
- Mounting structure specifications.
- Warranty information.
- Proposed project team and CVs of key technical personnel.
- After-sales service and maintenance approach.

B. Financial Proposal

The financial proposal shall provide a detailed and itemized quotation based on the attached BOQ, including:

- Equipment and materials.
- Transportation and delivery.
- Installation.
- Testing and commissioning.
- Training.
- Any applicable taxes and duties.
- Warranty and after-sales support.
- Any other costs necessary to provide a complete and functional system.

16. Site Visit

Interested companies are strongly encouraged to visit the SOS Children's Villages Hargeisa Compound before submitting their proposals.

The site visit will allow bidders to:

- Inspect the proposed PV installation locations.
- Assess roof conditions and access.
- Inspect existing electrical infrastructure.
- Assess cable routes.
- Review the proposed inverter and battery installation locations.
- Identify any site-specific requirements that may affect implementation and pricing.

17. Duration

The bidder shall provide a detailed implementation schedule showing:

1. Mobilization.
2. Procurement and delivery.
3. Installation.
4. Testing.
5. Commissioning.
6. Training.
7. Handover.

18. Submission of Proposals

Qualified and interested solar energy companies are invited to submit their technical and financial proposals with other required documents as per the above-mentioned document to SOS Hargeisa procurement office through the Tender Box at Gannad, Xero awr road.

Deadline: 22nd October 2026 at the end of the business day 1:00PM.

For any questions or clarification please contact to Mawlid.Omar@sos-somaliland.org
from 9th to 12th October 2026