Brining hearts and minds together for children

Plan International Sudan
White Nile Program Area
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TRAINING			
SPARE PARTS			
Lamps			
Power Meters			
flour mill grind stone			

Please each bidder should add lines and description accordingly to its offer

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Annex 6. Bills of quantities

ITEM description	UNIT PRICE	QUANTITY	TOTAL PRICE (including transportation and installation)
PHOTOVOLTAIC MODULES			
Product (type , model, etc)			
STEEL STRUCTURE FOR SOLAR PANELS			
Product (type , model, etc)			
HYBRID INVERTER			
Product (type , model, etc)			
Solar MOTOR DRIVE			
Product (type , model, etc)			
BATTERYES			
Product (type , model, etc)			
Water pump			
Product (type , model, etc)			
FLOOR MILL			
Product (type , model, etc)			
DC cabling			
Product (type , model, etc)			
AC CABLING			
Product (type , model, etc)			
PV-DC JUNCTION BOXES			
Product (type , model, etc)			
EARTHING SYSTEM			
Product (type , model, etc)			
MAIN DISTRIBUTION BOARD			
Product (type , model, etc)			
ELECTRICAL LOAD AND USERS CONNECTIONS			
METERING SYSTEM			
CIVIL WORK			

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Annex 7. Monthly and annual weather data for White Nile State

Month	Minimum ambient temperature	Maximum ambient temperature	Bright sunshine duration	Relative humidity	Mean Wind speed measure
	°C	°C	HRS	%	KM.P.H
January	19.1	32.9	9.6	39	10
February	18.03	32.7	9.7	34	10
March	22.8	38.5	9.2	29	10
April	24.8	40.1	9.3	26	8
May	26.6	39.9	8.4	46	8
June	25.8	38.6	7.7	55	10
July	22.o	33.8	6.3	75	9
August	23.5	32.9	6.3	78	7
September	23.5	33.7	7.5	76	6
October	24.4	37.6	8.9	58	6
November	22.8	37.3	9.8	40	8
December	19.6	33.6	10.0	39	10
Annual	20.9	36.0	8.6	49.9	8.5

Source: (Meteorological Authority - White Nile State 11/01/2022)

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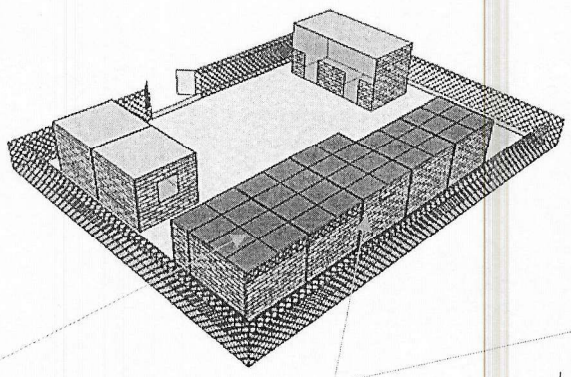
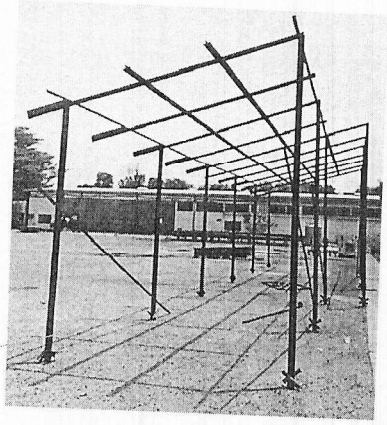
7. **Monthly and annual weather data for White Nile State**
8. **Financial Offer**

Annex 6. Similar design example.

Following is an example of a similar design used in another Plan International project used also to power Income Generating Activities and for solar energy solutions commercialization. This example is shown for concept reference (size might be different).





Solar panels

Space underneath might be used for Income Generating Activities.

Fence around the infrastructure might be necessary for security reasons. To be considered for the design.

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- Excellent communication skills.
- Gender balanced team.

12. Submission Information:

Interested candidates are invited to submit via email one (1) application package to Operation Support Service Department via Ahmed.Ibrahim@plan-international.org

- CV in English which clearly states relevant expertise/experiences;
- 1 technical proposal including detailed work-plan and methodology, including but not limited to:
  - Equipment, brands and tools used to supply and manufacture and detailed civil work.
- 1 financial proposal, which shall include consultants' fees as well as all other costs related to the equipment supply, civil work, installation & testing as well as (transportation and accommodation if needed, etc).

Only shortlisted candidates will be contacted for further steps.

13. Data Confidentiality and Privacy and Safeguarding of children and young people

The Consultant undertake to respect and protect the confidentiality of all information acquired as a result of or pursuant to this Term of Reference and will not, without the other Plan International prior written consent, disclose any such information to a third party, unless it is required to do so by any applicable law or regulation or is specifically authorized, Plan International must comply with Applicable Law and implement any additional policies or procedures as required1. Moreover, other Plan International policies impose additional requirements regarding the collection, use, and protection of particular classes of Personal Data, including the requirements described in the Global Policy Safeguarding Children and Young People2.
The Consultant must read, sign on and apply Global Policy Safeguarding Children and Young People in all the process of this study, as well as the Anti-fraud policy.

14. Terms of Payment

Plan international Sudan shall pay the consultancy fee to the consultant as agreed between both the parties by contract agreement in USD or equivalent in SDG.
p. All expenses shall also be included in the contract agreement. Initial payment of 30% will be made upon the signature of this agreement with detailed work plan approved by Plan international-Sudan, the remain being paid upon the delivery of the completion of all previously outlined activities.

15. Annexes

1. **Project Proposal**
2. **Project Log frame work**
3. **Plan Child Protection Policy**
4. **Best Interest Assessment (BIA)**
5. **Civil work / Bills of quantities**
6. **Similar design example.**

[1]Data Privacy Policy, Plan International, March 2018.
[2]Global Policy Safeguarding Children and Young People, Plan International, November 2017.

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8. Plan International Sudan Responsibilities:

- Arrange and manage negotiations with the government and other implicated actors such us the UNCHR for the location of the MSPs and other logistics aspects.
- Provide the consultant team all the relevant project information, including the preliminary market and energy demand assessment.
- Project Manager & YEE lead, MEAL Coordinator and Plan International Spain will be involved in all assessment process to ensure that this exercise meets the project's objective.

9. Contractor Activities and Responsibilities:

The consultant key activities will include but not be limited to the following:

- Review and analysis of the relevant data/information related to the preliminary study previously performed, technical specifications provided.
- Conduct site visit to confirm the location, design and installation requirements (if requested by the contractor).
- Desktop review and analysis of the relevant data/information related to the preliminary study previously performed.
- Submission of a draft design and finalize it based on comments and inputs from Plan International.
- Submission of final design.
- Submission of a procurement and installation proposal following the financial and technical layout provided by the present TOR.
- Provision of safety and security guarantees and of 5 years' warranty.
- Supply original items for installation.
- Provide testing module and schedule
- Conduct refresher technical training for the project beneficiaries on MSP operating and troubleshooting and well as fixing simple problems.

10. Expected Contractor Deliverables

- Quality documents (Narrative, cable routing, Drawing, Technical specifications, List of materials, CAD Drawings and simulation`s for the MSP`s) for one single solution for the Multi Solar Platform.
- Technical specifications and data sheets, drawings as well as a list of materials and financial offer using the provided layout for one single solution for the Multi Solar Platform.
- Provide the duration of accomplishing the work.
- Maintain safety and security measures.
- Provide at least 5 years of warranty.

11. Contractor Profile

- At least experience in 2 similar jobs of Solar Platform designs related to renewable energy based IGAs (to be demonstrated with documentation).
- Familiarity with White Nile State especially refugee's business community.
- Excellent networking skills.
- Excellent knowledge of gender equality and protection issues.

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power, data sheet		
Shaving table with chair Mark, Model and origin, power, data sheet		
Ac socket Mark, Model and origin, power, data sheet		
Phone charger Mark, Model and origin, power, data sheet		
Metal cabinet Mark, Model and origin, power, data sheet		
Blender		
Plastic chair		
SPARE PARTS		
lamps		
Power Meters		
Fluor mill grind stone		
Others		

7. OPERATING CONDITIONS

The equipment requested is intended to be installed in isolated locations with few qualified mechanical and electrical personnel. Resistant material, which respects the technical specifications indicated in **Annex 1-Appendix 5**, is therefore required, both for the main components and for the mounting accessories, in order to require the lowest possible maintenance and to resist corrosion and long-term degradation.

8.1 REFERENCE CLIMATIC CONDITIONS

In order to facilitate the comparison of tenderers' proposals, a set of reference conditions is specified in this paragraph, which relate on the one hand to the climatic characteristics to be considered for the dimensioning, and on the other hand to the standard dimensions of the devices, specified by the standard installation drawings. It is specified that the actual installation parameters may differ from these standard values.

The equipment proposed by the bidders shall be sized to deliver the daily energy specified for each site under the reference climatic conditions corresponding to a "typical day" profile. The climatic data for each region is given below.

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Mark, Model and origin		
CIVIL WORK (POWER ROOM AND FLOUR MILL STEEL Room)		
Power room Please indicate relevant component here		
Fluor mill stall Please indicate relevant component here		
Water tank base		
SYSTEM TRAINING		
Please indicate relevant component here		
METERING SYSTEM		
Users meters (number, types, model, data info **Mark, Model and origin**		
ELECTRICAL LOAD AND USERS CONNECTIONS		
lamps **Mark, Model and origin, power, data sheet**		
Ceiling fan **Mark, Model and origin, data sheet**		
Users meters **(Mark, Model and origin, type, etc**		
0.5 HP 1PH water pump **Mark, Model and origin, power, data sheet**		
Water tank **Mark, Model and origin, power, data sheet**		
blender **Mark, Model and origin, power, data sheet**		
Freezer **Mark, Model and origin, power, data sheet**		
water tank **Mark, Model and origin, power, data sheet**		
Hair clipper **Mark, Model and origin,**		

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Voltage		
Number of units		
Reference datasheet		
Flour mill motor		
Power, type		
Mark, Model and origin		
Reference datasheet		
FLOUR MILL		
Mark, model, origin		
Please indicate relevant component		
DC CABLING		
Please indicate relevant component here		
Mark, Model and origin		
AC CABLING		
Please indicate relevant component here		
Mark, Model and origin		
PV-DC JUNCTION BOXES		
Please indicate relevant component here		
Mark, Model and origin		
EARTHING SYSTEM		
Please indicate relevant component here		
Mark, Model and origin		
MAIN DISTRIBUTION BOARD		
Please indicate relevant component		

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6.3. Components of the MSP:

specification of one MSP as follow

ITEM	REFERENCE CHARACTERISTICS	BIDDER PROPOSED CHAARACTERISTICS
PHOTOVOLTAIC MODULES		
PV array over all capacity		
Number of units		
Module Mark, Model and origin		
PV module type / STC capacity		
Reference datasheet		
Mounting STRUCTURE FOR SOLAR PANELS		
Type of structure		
Mark, Model and origin		
Tilt		
Lowest point	At least 3 m	
Wind resistance	140 km/h	
Description of the materials and of the general solution		
HYBRID INVERTER		
Mark, Model and origin, capacity		
Reference datasheet		
Solar VSD drive		
Mark, model, origin		
Please indicate relevant component here		
Reference datasheet		
BATTERY AND BATTERY RACK		
Type/Technology		
Mark, Model and origin		

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6.1. AREA OF APPLICATION

The present technical specifications concern the supply and installation of 2 multifunctional solar platforms (MSPs) to deliver a continuous and reliable service in the project's target camp.

These specifications are minimum requirements that must be met by tenderers. However, bidders are encouraged to propose improvements in line with the following basic principles:

(i) reliability of the equipment,

(ii) optimization of the operating and maintenance conditions to take account of climatic conditions.

(iii) "Cost effective" technical solutions

The technical solution chosen for this project is a Micro-grid solar system, so a PV generator with a LV mini-grid supplying electricity to the various production units.

6.2. Safety aspects

Protection against electric shock:
Protection against electric shock in the DC side shall be achieved by best practice and international standards and by components and systems classified as Class II or better.
For the AC side, double or reinforced insulation protection between any live conductor and any *earthed or exposed conductive part is required.
Please consider also the specifications included in the chapter 6.2.8, 6.2.9 and 6.2.10.

2 Overcurrent protection:
The inverter cable overcurrent protection should be installed between the battery and the inverter as close as possible to the battery.
In the PV generator, overcurrent protection is required in the strings: fault currents due to short circuits in the modules, in the junction boxes or in the module wiring or to ground can cause an overcurrent in a PV generator. PV modules are limited sources of current, but they can be subject to overcurrent caused either by multiple parallel adjacent strings or by external sources or both. For this reason, current protection of each string is mandatory.
Please consider also the specifications included in the chapter 6.2.8, 6.2.9 and 6.2.10.

2 Protection against the effects of lightning and transient overvoltage
The level of protection of electrical installations is important for reasons of safety of man, plant and equipment. The level of protection of electrical installations depends on many aspects such as the type of installation (overhead/underground) of the network, etc. The most important factors are described below:

- Electrical insulation material of the equipment.
- Characteristics of overvoltage protection devices.
- Appropriate earthing system.
- Lightening protection system including cables, mast and all required accessories.
- Lighting arrester should be of pure copper.
- All metal casing/shielding of the system and its components should be thoroughly grounded.

The overvoltage protection devices installed in the installation must comply with the international standard IEC 61643-11.

Signaling
At least the electrical diagram of the installation and the layout diagram of the photovoltaic generator components, in the form of laminated documents, will be placed near the main switchboard.

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6. Scope of work

The scope of work for contractor includes not only: complete design, engineering, manufacture, supply, install, storage, civil work, testing and commissioning of twin-of grid-solar PV project referred to as (MSP) Multi-Functional Solar Platform including:

- All cables work (install, dig, burry, terminals)
- power house construction.
- Store room (mill grain room) construction.
- dedicated area (solar PV pergola and protected (with a fence) area below the panels) construction.
- water supply constructing and implementation (water tank, tank base, pipes, water tap)
- Design of all users' connections. And low voltage internal grid.

Supply and install of user's electrical equipment's and IGAs (equipment referred to in facility type definition description (Table (3) Electrical equipment, out lets and IGAs requirement)

- procurement of all the required materials at local and/or international level, including logistics
- Involvement of 10 local committee members responsible for O&M in the installations phase as training purpose. Training for the O&M aspects for a 10/15 audience. 2-year O&M performance period.

- **To this end, the tenderer will be required to produce designs, studies and execution plans for all the buildings, infrastructure and works. In particular, he must ensure that all dimensions and requirements are met.**

- **All definitions, leads and outlets, design requirements and solutions are for one refugee camp and they are to be replicated on the other camp.**

6.1 List of documents to be submitted for this proposal:

- Provisional order, supply and delivery schedules of the equipment to the site. **NOTE: the maximum deadline for the commissioning of the 2 MSP will have to be no later than 3months from the contract signature.**
- Layout plans for all the components, including Civil works;
- Cable and wires routing plans;
- The electrical diagrams of the cabinets.
- Distribution gird (if applicable).
- Users connections from the connection boxes up to the meters.
- Internal user's connection (from the meters up to the switches, sockets, lights etc.).
- Justified calculation notes leading to the choice of equipment;
- The technical data sheets specifying the exact characteristics of the equipment, including warranties and relevant information;
- Detailed description of the installation;
- Financial Offer (see layout included in Annex 6).
- Insurances

All documents will be submitted in English to Plan International for approval prior to the start of the work.

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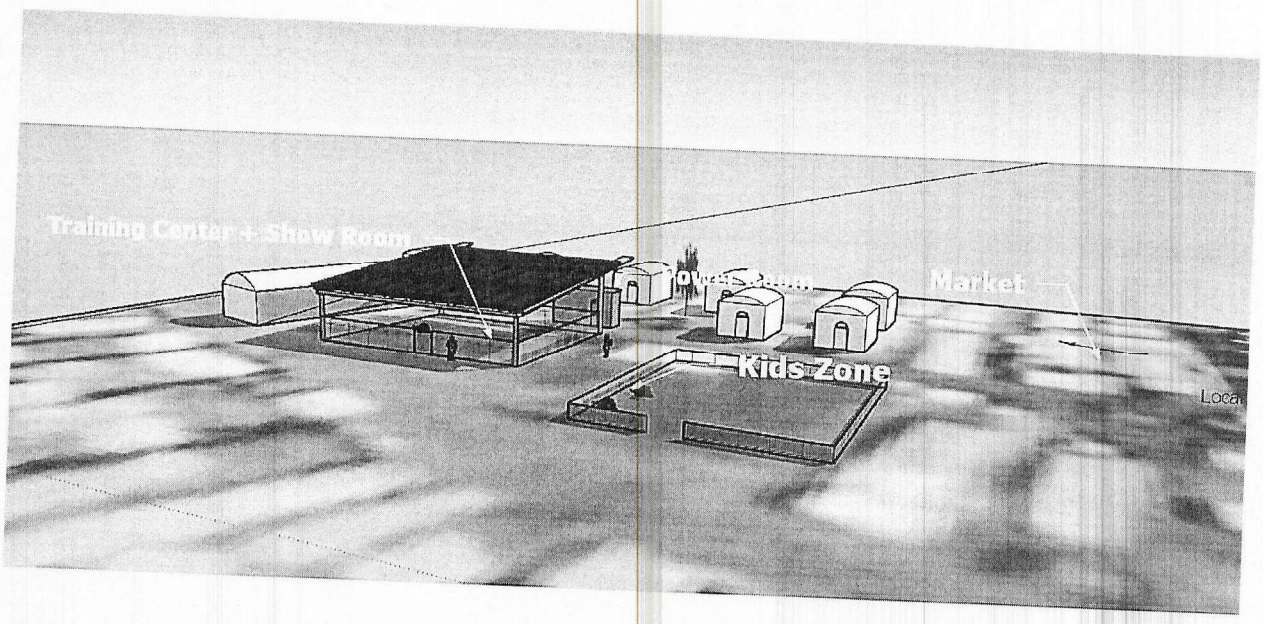

5.6. Metering System

- Electrical power/energy consumption metering system should be provided for each consumer to manage the consumption.
- Original data sheet is required.

5.7. System Training

A training session should be held to technicians on systems maintenance and operation

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switches		with Grade A suitable switches	reliability, 65 IP rating	LM/W
Ac socket	40	2 pole, socket	Grade A, high reliability 16A sockets	--------
Phone charger	20	phone charger	High efficiency, high reliability grade A mobile phone charger	--------
Metal cabinet	2	Metal cabinet (table shaped) with two lockable doors	(100 cm length,60 cm width, 70 cm height) Metal cabinet with two shelfs.	--------

Table (3) Electrical equipment, out lets and IGAs requirement

5.5.5 Civil works (Power room, flour mill stall water tank base)

5.5.5.1 Power room

A Power room with dimensions of 4m x 4m x 3m height should be constructed beside the power generator, for mounting the inverter, batteries. A steel partition (4 x 1.8 m height) with a door and a lock made of squire pipes and iron sheets with painting must be installed inside the room to separate the inverter and the batteries the room must be close to the PV generator.

- The power room should be well secured and ventilated, with a rugged steel door and three louvers with mesh of expanded metal.
- The walls should be built of red bricks (1.5 red bricks) and cement mortar 1: 6.
- The roof of the room should be of metal sheet (zinc) with the thickness of 35 mm.
- The floor should be made of white concrete layer with the thickness of 10 cm.
- The door should be steel (1.2 x 2.2 m) of heavy pipes (Akumi).
- 3 louvers with expanded metal with dimensions of 2x 4m with metal shade to maintain well ventilation to the power room.
- The rooms should be luminous by 2 lamps and a ceiling fan.

5.5.5.2 Floor mill steel room

A steel room should be constructed inside the fence area with the door opening to the market of rugged iron sheets with dimensions (3×3×3 meters)

- The floor should be covered with white concrete layer with the thickness of 10 cm.
- The roof should be made of metal sheets (zinc) with thickness of 35 mm.
- Anti-Corrosive property against harsh environment.
- The door and the windows should be steel (1.2 x 2.2 m) of heavy pipes (Akumi).
- The standing columns should be of 2-inch rugged steal angle.
- The windows should be secured by expanded metal sheets.

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5.5.4 Electrical equipment, out lets and IGAs design requirement for one camp

Electrical equipment, out lets and IGAs requirement				
Supply install test and commissioning with all connection, wiring and full accessories of:				
Equipment type	Numb	Description	specs	Minimum Efficiency
15HP motor	1	General performance, three phase squirrel cage TEFC cast iron induction motor	Output power: 11 KW, 15 HP Rated voltage 415 V Winding: Copper Body material / housing / casing: Cast iron Standards: CE, IEC 60034-1, Isolation class: F Operating frequency: 50 Hz	Efficiency class IE3
Flour mill	1	flour mills which is capable of grinding grains (maize, wheat, sorghum … etc.)	Electric motor capacity: Three-phase, 15 HP, 11.2 Kw, 1500 rpm Grinding wheel diameter: Maximum16 inch Grinding wheel thickness: 114 mm Type and size of belt: 10" × 2 B V-belt Shaft diameter: 36" × 40 mm Ball bearing: 2 pcs	Grinding capacity at least per hour: 100 Kgm
0.5 HP 1PH water pump	1	High efficiency water pump	High efficiency high reliability 1 energy efficient 1 PH 240V water pump	20 liters per minute
Water tank	1	Plastic water tank	500 ltr grade A ,plastic water tank	-------
blender	1	High efficiency Heavy duty 1.5 ltr blender	Grade A, high efficiency	--------
freezer	1	450 LTR deep freezer	1 PH, 230V, R29, inverter type	
water tank	2	4 gallons water tank	--------	---------
Hair clipper machine	6	Rechargeable electric hair clipper	Professional heavy duty minimum 8,000 RPM, Stainless steel blade, lithium ion battery, type C charger. Support quick charging.	Minimum run time 50 minutes
Shaving table with chair	2	metal table with built in mirror. metal chair	Suitable metal table with built in mirror. High, comfortable metal chair, suitable for the application	---------
TV and receiver	2	SAMSUNG or LG TV and TV receiver	grade A 30-inch flat screen LED TV, with TV receiver. with full accessories	------
Plastic chair	26	Plastic chair	Grade A plastic chairs	------
ceiling fan	5	ceiling fan 1400 cm diameter with switch	High speed air flow >=83m^3/min	2.75m^3/min/W
Lights AND	40	LED lighting tubes	Grade A high efficiency, high	Minimum 100