

## **Terms of References**

### **Installation and Commissioning of Solar Power**

The UNFPA ETH CO office have procured 6 (six) solar powers to refugee camps health centers around Gambella and the specification for the procured solar power is given in section 1. The procured solar power equipment are kept in Administration for Refugee and Returnee Affair (ARRA) Gambella Zonal Sub- Office. UNFPA ETH CO has commissioned one firm to study the possibility of installing the solar power in selected six refugee camps health facilities ( see below) and come up with a detailed report of their study. Based on this report, UNFPA is seeking the services of reputable firm with the required experiences and capability to install and commission the solar power.

With this understanding, UNFPA ETH country office is seeking the services of a company who can provide the installation, and commissioning of solar powers in selected areas.

#### **Details of Technical Requirements for the Installation and Commissioning of Solar power**

##### **1. Installation of solar power and Commissioning and provision of Training**

UNFPA ETH CO office have procured six (6) solar power to refugee camps around Gambella to provide solar power with an output for: *5 pieces of 11W alternative current lamp for 10 hrs. /day, 365W solar fridge for 24 hrs /day and, 2000W autoclave for 2 hrs /day.*

##### **Nominated Area for the Installation**

###### **Gambella Refugee camps**

- Terkidi (1 solar Power),
- Kule (1 solar Power),
- Jewi (1 solar Power),
- Pugnido 1 and 2 (2 solar Power) and
- Nguenyiel (1 solar Power).

##### **2. Identification of Equipment already in UNFPA stock to be installed in each of the six sites and quantification of additional materials need for the installation**

*For each of the six sites the available solar material in the UNFPA stock is identified to be:*

- 2.1 Mono crystalline Solar PW Bank, sized 2512 watt, N.1 set
- 2.2 Pure Sine Wave inverter DC to AC current, sized 2500 VA, N.1 pc
- 2.3 Solar Charge Controller 60A, N.1 pc
- 2.4 Solar VRLA Sealed Battery, 100 A, N. 8 pcs

**2.5 Led Solar Lamp, 5 watt, 220 Vac, N.5 pcs**

*Currently the items which are not in stock and has to be purchased the following materials:*

**2.6 Roof mounted Module Rack, flat, made of RHS T-profile, varnished with epoxy , to fix the Solar Panel Bank to the roof of MCH building in 5 of the six sites.**

For the 3 sites with Solar Panel Bank made of 34 panel of 75 watt each ,this metal frame will be in each of the 3 sites cm 1199 length , cm 171 wide , cm 3 height , with inclination corrector frame cm 25 height

For the 2 sites with Solar Panel Bank made of 42 panel of 60 watt each ,this metal frame will be in each of the 2 sites cm 986 length , cm 213 wide , cm 3 height with inclination corrector frame cm 25 height

**2.7 Ground mounted Module rack, standing on 12 pole 3 mt height, RHS 40x40 x2 mm, epoxy varnished, with cement mortar block at the feet for the site of Punigdo 2, where the roof of MCH is covered by the tree shadow.**

This Module Rack with Solar Panel bank made of 34 panels of 75 watt each will be cm 1199 length, cm 171 wide with a thickness of cm 3. The frame itself will be made of RHS T-profile, epoxy varnished, and will be fixed on the standing poles.

**2.8 Solar Copper cable 1x 16 mm, double shielded, double insulated, to connect the solar panel and create the strings at nominal 14 Volts DC. Each site should need mt 40 copper cable for positive and mt 40 copper cable for negative.**

**2.9 Solar Copper Cable 1x45 mm, double shielded, double insulated, to connect the Solar Panel Power-bank strings to the controllers and the controllers output to the Battery Bank. Each site need 42 mt of positive cable and 42 mt of negative cable.**

**2.10 Battery Jumper Copper Cable 1x45 mm, double shielded, double insulated, to interconnect the elements of the Battery Power-bank and then to connect the Battery Power-bank to the inverter. Each Battery Power-bank need 7 meters of positive cable and 7 meters of negative cable**

**2.11 Battery, Inverter and MCB (main control board) Cabinet, This cabinet has to host, in each of the 6 sites, the 8 batteries, the inverter and the main control board. The eight batteries will be installed on two shelters inside the cabinet, and another shelter will host the inverter and the MCB. The cabinet size should be cm 80 x 50 x 120 (L xW x H) with adequate ventilation.**

**2.12 Cable lugs for connections. Each site need 160 pcs of lug connector diam 16 mm and 26 pcs of lug connector diam 45 mm.**

2.13 Structural silicon. Each site need 8 pcs of structural silicon cartridge, to fix the panels and the frames and to insulate the junctions.

2.14 Connectors bars, 12X16mm, 100 Ampere. Each site need 12 connector bar

2.15 Led Bulbs, AC, 9 watt. While in stock are available only n.5 Led bulbs ,5w, for each site it is need at least n. 10 Led bulbs , AC,9 watt each to cover the delivery room and the degent patient room. Possibly these lamps have to be Emergency Cordless GP lamps, that can be charged by a charging desk and hooked every night where is need. these GP lamps are operated by remote. By using these lamps there will be no need of domestic wire and switches. The same lamps are portable, therefore can be used for emergency outreach operations.

2.16 AC electric cable, insulated, made of copper, to connect light points and sterilizer to the inverter output and to connect the Inverter of the Punigdo 2 power station to the MCH building,

For each site, to connect the delivery room and the sterilizer to the inverter breaker board, it will be need mt 150 of 2x2.5 mm electric cable and mt 200 of 2x1.5 mm electric cable .

For Punigdo 2 it will be need of mt 100 of industrial 2x6 mm cable from the solar installation site to the breaker board in the MCH building.

2.17 Lamp holders, switches, Sockets and plugs. For each site it will be need adequate number of these electrical fittings, depending the number of light point and power socket decided.

### **3. Identification of existing equipment in the MCH Delivery Rooms and Lab**

*Every Delivery Room is or will be soon served by:*

3.1 Oxygen machine n. 2, with power need of 360 watt (rated)

3.2 Suction Machine, n.1, with power need of 1600 watt (rated)

Every laboratory in the six health centers has , or will soon receive, almost the same basic equipment or composed by machinery as hereinafter listed as :

3.3 Microscope , 25 watt each, 2 pcs working in average 4 hrs/day

3.4 Blood Shaker, 300 watt each , 1 pc ,working in average 4 hrs/day

3.5 Blood Centrifuge, 300 watt, 1 pc , working in average 4 hrs/day

3.6 Blood Centrifuge, 440 watt, 1 pc, working in average 4 hrs/day

3.7 Fan, 300 watt, 2 pcs , working in average 4 hrs/day

3.8 Sterilizer ,2000 watt, 1 pc ,working in average 1 hrs/day

Moreover In 2 Health Centres , namely Punigdo 1and Tiarkidi there are:

- 3.9 CBC Blood Analysis machine , 900 watt, 1 pc, working in average 6 hrs/day
- 3.10 Photometer analyzer , 460 watt, 1 pc , working n average 4 hrs/day
- 3.11 Computer Desk , 560 watt, working n average 4 hrs/day

Moreover the cold chain for vaccine and blood conservation is currently served by:

- 3.12 In Punigdo 1, main site: AC Domestic fridge 300 liters, 380 watt/hr, 9120 watt/day
- 3.13 In Punigdo 1, site 12: AC Fridge 230 lt, 350 watt/hr, 8400 watt/day
- 3.14 In Punigdo 2 site : AC Fridge 230 lt, 350 watt/hr, 8400 watt/day
- 3.15 In Jewi site: AC Fridge 350 lt, 350 watt/hr, 8400 watt/day
- 3.16 In Tiarkidi site : AC Fridge 230 lt, 350 watt/hr, 8400 watt/day
- 3.17 In Tiarkidi site: DC Solar Refrigerator, batteryless, Sundanzer 55 litres ( but without solar panels)
- 3.18 In Tiarkidi site: DC Solar Refrigerator, battery-less, Solarchill 55 litres

#### **4. Identification of priority need in the sites**

After interview with technical staff of MCH and OPD in the sites it was commonly determined that , in every health centre , priority need was the same, described as follows:

for the delivery operations in MCH it is need, for each centre :

- 4.1 Lighting: Strong Light on the delivery chairs, minimum 200 watt of conventional incandescent bulbs, equivalent to Led Lamp 9 watt 24 Led, 4 pcs
- 4.2 Lighting: Delivery Room service area, n. 2 Led lamps 5 watt each
- 4.3 Lighting: Delivery Room emergency pharmacy n.1 Led lamp of 5 watt each
- 4.4 Power socket: Delivery Room, 1 socket for Oxygen Machine, 400 watt
- 4.5 Power Socket: Delivery Room, 1 socket for Suction Machine, 1600 watt

for the degent care (IPD), for each centre:

- 4.6 Lighting, n.8 Led lamps 5 watt each

For the Lab operations it is need no lighting but power socket for the machines:

- 4.7 Punigdo 1, main site: 18240 watt /day
- 4.8 Punigdo1 site 12, 8760 watt/day
- 4.9 Punigdo 2, 8760 watt /day
- 4.10 Tiarkidi, 18240 watt/day
- 4.11 Ngweyel, 8760 watt /day
- 4.12 Jewi, 8760 watt /day

#### **5. Installation consideration**

After evaluation with the local team of doctors of the exposition of the solar power stations to procured damage by children or bad willing people,

After evaluation of the roof condition and inclination and exposure East-West to the sun rays,

The Survey Team suggest to install the Solar Panel banks on the roof of MCH buildings with the exception of the Punigdo 2 site where the tree shadow on the roof does not allow a correct power production. In order to avoid tree cutting, only for this mentioned site it was decided to install the PV panels on a ground mounted rack, and the waterproof power cabinet inside a well fenced are under the Panel Rack .

## **6. Conclusions of the survey**

*It is indeed evident that the existing equipment cannot serve the full need of the Health Centers, but has to be limited to the MCH Delivery Operations Room lighting and sterilizer use;* but also for this restricted aim, there is a need to implement the lighting unit numbers and type. To provide a metal cabinet for each center where to install the batteries and the inverter that cannot be installed in open air for third party potential danger consideration.

In order to save money for this small investment the survey team suggest to use the GP Led Emergency Lamp with a charging desk. These lamps can be daily charged by screwing in the charging desk and can be fixed in the night time to the floor or the wall by hooking the GP lamp to the female supporting ring. Once fully charged, these units can supply light for at least 9 hours.

These lighting units do not need any additional wiring and do not deplete the battery capacity of the system because they carry their own battery inside.

Moreover, it is here to put in evidence that such a devices can be used also for emergency outreach operations because of their mobility.

For what concern the optimum installation of existing equipment, after considering the presence of lot of children in the camps and the roof inclination and orientation, the survey team suggest to install the Pv panel rack on the roof of the MCH and the Battery/Inverter metal cabinet inside of the building.

## **7. Recommendations**

Considering the local lack of electric energy the Survey Team suggest to serve as soon as possible with solar energy:

8.1 The cold chain for blood and medicines safe preservation. The area is characterized by very high temperature, so this emergency is crucial for the service delivery to the people.

Out of 6 health centers, only one is equipped with solar vaccine refrigerator, but the team suppose that these units are available from the Ministry of health. Otherwise small solar systems of 1 kw each can solve the problem.

8.2 Also centrifuges and CBC analyzers need a prompt supply of energy. It is opinion of team that when sterilizers are not in use, surplus power of the MCH station can be devolved to these uses, by rotation and program of the use time.

The cost of this surplus extension is absolutely cheap because consist only of wiring, socket and switches.

8.3 Lighting of the patient emergency rooms is also important, because the deserved area is very crowded. Some GP Emergency Led lamp can be used for this purposes, served by the MCH power station. Related cost is very low.

*Based on the above details of the technical requirements, UNFPA wants a firm to understand the requirements and provide their technical proposals with the required financial offers separately.*

### **8. Requirements of the Firm**

The service provider is expected to fulfill the below requirements:

- Renewed and Valid Business License in the related area and registered for VAT;
- At least 2 years of proven technical experience for the provision of technical support in solar power and supply of its parts.
- Past Two Years Audited Financial Statements ( if Any ) or Company's Financial Statement;
- The firm need to provide and attach previous work experiences or testimonial from at least two organization as a proof of delivering successful work completion/performances.
- Other Certificates and Accreditations – including Quality Certificates, Patent Registration, Environmental Sustainability (if any) etc need to be attached;
- Ensuring highest ethical standards and confirm to organizational policies.
- Summary of Key Personnel Qualifications: CV of Production Manager

### **9. Logistical Arrangement**

The financial proposal should include estimates of installing the solar power, commissioning and training to users, and any additional professional and logistical fees. All logistic requirements (transport, stationary item, communication items etc...) should be included in the financial proposal.

*In additions, the vendor should provide their detailed cost for the various equipment (indicated and not indicated in this Terms of References) which are necessary for the installation of solar power. Moreover, it is assumed that, since the batteries which have been procured as part of the solar power equipment were kept in the warehouse and have stayed more than two years without providing services. Hence, their functionality are not checked, and if the batteries are not functional, we need the vendor also to quote the cost of battery and supply the required battery for installing the solar power.*

### **10. Payment milestones and authority**

The prospective bidder will indicate the cost of services for each deliverable ( Cost of the required equipment, professional fee, transportation, commissioning, training to the user, and other relevant

cost) in ETB when applying for the captioned services. The firm will be paid in lump sum up on satisfactory completion of the assignment and certifications of completion from UNFPA responsible colleague.

**11. Criteria for Selecting the Best Offer**

The evaluation will be carried out in a two-step process by an ad-hoc evaluation panel. Technical proposals will be evaluated and scored first, prior to the evaluation and scoring of price quotations

**Technical Evaluation**

Technical proposals will be evaluated based on their responsiveness to the service requirements /TORs listed in Section II and in accordance with the evaluation criteria below.

Criteria	[A] Maximum Points	[B] Points attained by Bidder	[C] Weight (%)	[B] × [C] = [D] Total Points
Technical approach, methodology and level of understanding of the objectives of the project	200		40%	
Work plan/time scales given in the proposal and its adequacy to meet the project objectives	100		20%	
Pervious Experiences with similar Assignments.	100		20%	
Profile of the company and relevance to the Project.	100		20%	
<b>Grand Total All Criteria</b>	<b>500</b>		<b>100%</b>	

**Financial Evaluation**

Selecting of the best offer will be made based on: Combined Scoring method: where technical proposal will be weighted a maximum of 60%, and combined with the price offer which will be weighted a maximum of 40%.

**12. Timeline**

The assignment will be completed within 6 weeks from the date of issuances of the purchase order.