Project Terminal Report
Electrification of Barangays Balatikan, Pikit, North Cotabato

1. Project Summary

- Name of Project: Barangay Balatikan Solar Home Systems Electrification in Pikit, North Cotabato
- Funding Agency: Office of the Presidential Adviser for the Peace Process (OPAPP)
- Implementing Agency: Department of Energy (DOE) and Cotabato Electric Cooperative – PPALMA (COTELCO-PPALMA)

2. Introduction

Payapa at Masaganang Pamayanon (PAMANA) is the national government's peace and development framework to respond and strengthen peace building, reconstruction and development in conflict-affected areas.

As support to the above national government's program, the Department of Energy (DOE), in coordination with Office of the Presidential Adviser on Peace Process (OPAPP), has endorsed the PAMANA project, for implementation in FY 2015, by electrifying the conflict-affected and vulnerable areas in two (2) Provinces in Mindanao using Solar PV System, targeting 150 households.

The DOE fully coordinated the implementation strategies, Project Implementation Plan and Memorandum of Agreement with the concerned Electric Cooperative (COTELCO-PPALMA) for the solar electrification projects in the above PAMANA target areas.

For COTELCO-PPALMA franchise area, the selected site is in Bgy. Balatikan, in the municipality of Pikit, Province of North Cotabato. In Bgy, Balatikan, there are Five (5) Sitios, namely: Toka Na Oleis, Palao,Kababan, Aleing and Campo & Sr. Malao

3. Site Description

Bgy. Balatikan is a hinterland barangay of Pikit Municipality. It is approximately 6 kilometers West – Northwest of Pikit proper. The barangay roads are considered dirt road and the means of transportation is by motorcycle and or

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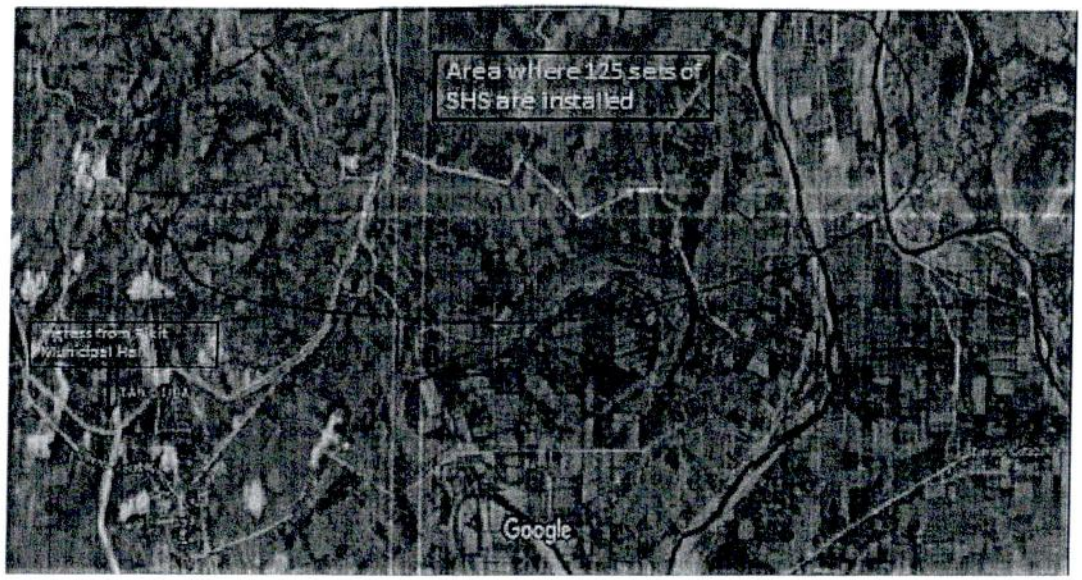
3. Site Description

Bgy. Balatikan is a hinterland barangay of Pikit Municipality. It is approximately 6 kilometers West – Northwest of Pikit proper. The barangay roads are considered dirt road and the means of transportation is by motorcycle and or

small 4-Wheel vehicles. The barangay is considered unelectrified as COTELCO – PPALMA has not yet extended its distribution lines to the said site.

There are one hundred twenty-five (125) households in the barangay which are all recipients of the SHS.

Bgy. Balatikan, Pikit, Cotabato Map



4. 50Wp Solar Home System Description

The solar home system installed in Bgy. Balatikan consist of the following components;

Item / Description	Qty
50Wp solar module with mounting frame and steel pole	1 set
70 Ampere-hour deep cycle battery	1 unit
Charge controller, 10A, 12V	1 unit
LED lights	4 pcs
USB slot and AM/FM Radio	1 set

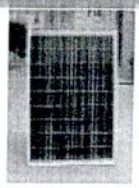
The 50Wp is designed to provide at least 180Watt-hours of electricity and is more than enough to provide power for the LED lights, Cellphone charger and the AM/FM Radio

Shown below is the estimated load and its equivalent energy consumption:

Load	Watts	Hours used	Watt-Hours
No. 1 - 3 Watts LED Light	3	4	12
No. 1 - 5 Watts LED Light	5	6	30
No. 1 – 3 Watts LED Light	3	8	24
AM/FM Radio	3	Watts	10
Cellphone charger	3	5	30
Total			106

From the above, if the 50Wp solar panel generates 180Watt-hours of energy, then it can supply the required energy for the appliances in the SHS.

Annex 1. 50Wp Solar Home System Specifications

Technical Data:			
Solar Panels		Type	1 X 50W Monocrystalline Panel
		Rated Maximum Power (Pmax)	50W
		Cell Type	Poly
		Tolerance	±3%
		Voltage @ Pmax (Vmp)	17.8V
		Current @ Pmax (Imp)	3.41A
		Short Circuit Current (Isc)	3.75A
		Open Circuit Voltage (Voc)	21.6V
		Nominal Operating Cell Temperature	47°C ± 2°C
		Panel Dimensions	690*540*30MM
		Standard Test Conditions	25°C 1.5AM ,1000W/m2
Battery		Voltage	12V
		Capacity	38Ah
		Battery Type	Deep Cycle, Lead acid
Controller		Capacity	12V 5A with LCD monitoring Display
Case		Construction	Steel, Outdoor Rated
		Case Dimensions	380*250*350mm
		Charge Controller	With LCD monitoring Display
		with 5 2.5V USB Port	DC12V,DC5V
		10-meters #10 Automotive Wire with eye terminal	stainless bolts and nuts
		Working Temp., Humidity	-20 ~ +70° C, 10 ~ 90% RH
		Storage Temp., Humidity	-20 ~ +85° C, 10 ~ 95% RH
5W LED Bulb and cable		2-5W LED Bulb, 12Volts with 5 meter cable	
9w LED Strip light		1-9W LED Strip light, 12V, 3-LEDs per inch with 5 meter cable with USB	
Cable		10-meters #10 Automotive Wire with eye terminal, stainless bolts and nuts (this cable is connect the solar panel and case)	

DOE-COTELCO PPALMA
PAMANA SOLAR ELECTRIFICATION PROJECT
IN BRGY. BALATICAN, PIKIT, NORTH COTABATO

50 Wp Solar Home System Specifications

PLUG AND PLAY SOLAR HOME SYSTEM

Item	**Details**	**Quantity**
1	Solar Module, 50Wp, monocrystalline, IEC61215 compliant	125 units
2	Solar module mounting structure, galvanized steel angle bar mounting frame, Stainless Steel bolts, flat and lock washers and nuts	125 sets
3	Battery Charge Controller, 12VDC nominal voltage, 10A, with maximum power point tracker (MPPT), PWM, boost recovery and float charging	125 units
4	Maintenance Free Lead acid battery, 12V, 70Amp-hr minimum	125 units
5	Light Emitting Diode Lamp, 7 Watts, 12VDC nominal voltage, 100 lumens per watt, color temperature of 6000-65000K, life span > 50000 hours; E27 base with receptacle	125 units
6	Light Emitting Diode Lamp, 3 Watts, 12VDC nominal voltage, 100 lumens per Watt, color temperature of 6000-65000K, life span > 50000 hours; E27 base with receptacle	250 units
7	Light Emitting Diode Lamp, 1 Watt, 12VDC nominal voltage, 100 lumens per Watt, color temperature of 6000-65000K, life span > 50000 hours; E27 base with receptacle	125 units
8	Battery Box, able to fit, 12V battery, with cover, Acid Resistant, ABS Plastic front and back cover for easy battery access and maintenance	125 units
9	Built-in Digital AM/FM/SW/MP3 Radio, with built-in dual speakers, 6 radio channel memory button for easy channel selection, with TF memory card slot	125 units
10	Built-in USB Port, 5VDC for cellphone charging	125 units
11	UV Stable Cable, Royal Cord, 2-Conductor, No. 14, 15m/SHS	125 units
12	Indoor Cable, Type NM, No. 16, 2 Conductor, (10m/LED lamp by 4 LED lamp) 40m/SHS	125 sets
12	GI Earth Pipe 2.0inches diameter, 5 feet long, schedule 40	125 units
13	C- or Saddle Clamp, 2", 3 per SHS	125 units

User's Manual for 50W Solar Power System with MP3

I、【Products Features】

This Mini solar power system meets people simple requirement of power, it collects renewable solar energy and transfer it into electricity, it provides Lighting (DC LED bulb) and charging (DC12V/USB 5V) functions for the people who are in remote and power shortage area.

This Mini solar power system are also designed with some entertainment functions. It is with FM Radio and MP3. You can use SD card and USB devices to play MP3. It is also with remote controller.

This system is with smart power management the controller inside provides Over-charge& Over-discharge protection for the VRLA battery which can extend its'life effectively.

II、【Technical Data】

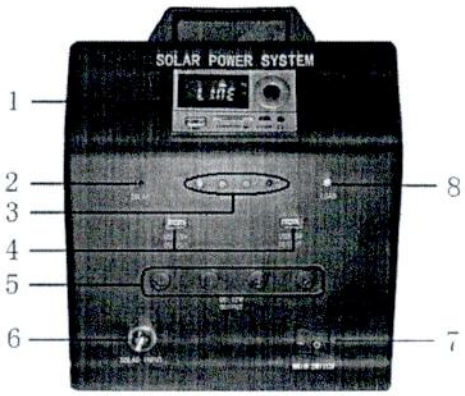
1、Solar Panels：50W/18V
2、Lead Acid Battery ：12V/70Ah
3、Output: DC 12V/5V USB 5V1A
4、Controller ：PWM 12V/10A
5、Charging mode: Solar panel charging
3、Operating Temperature ：0℃—+45℃,
7、Main case size ：460*220*300mm
3、Packing size: 560*235*320mm
9、N.W.：25.7kg

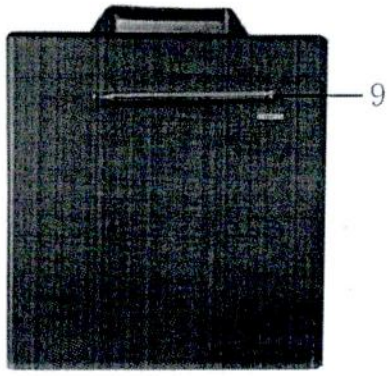
II、【Operating Instruction】

Charge the Equipment: Put the solar panels outside in the sun toward solar irradiation, and turn on the Host box's "MAIN SW TCH" , then connect solar panel to the input jack. Charging in licator turns red when it is charging. After the battery s charge l fully, it turns green.

When firstly use this equipment, please charge it fully. When ıot in use, remember to turn off the power "MAIN SWITCH", if ong time not in use, you should charge the battery inside ever three month, it can keep the battery in a good condition。

When use this equipment, turn on the "MAIN SWITCH", the Load indicator lights up, then DC output appliance can be connected, and you can turn on the radio and use SD card or USB device to play MP3.

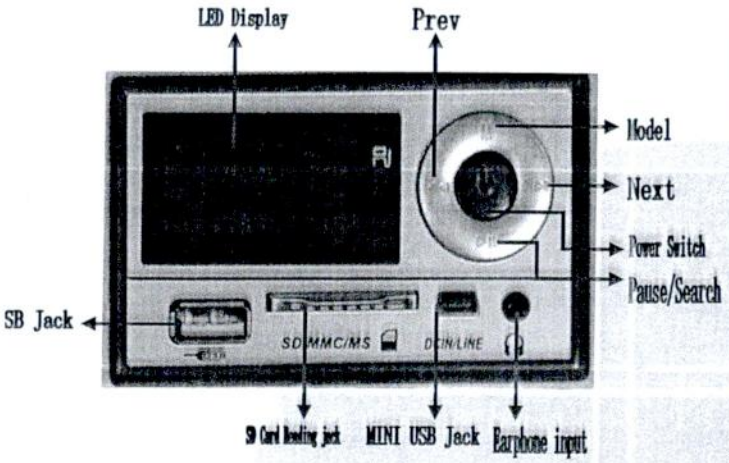




1. **LCD Display see** below diagram
2. **Charging Indicator turns** red when solar panels are charging battery.
3. **Battery Indicator** It turns red when out of power, otherwise it is green.
4. **USB 5V Output** for charging Mobile phones etc.
5. **DC 12V Output** Connect DC appliance here such as DC LED bulb etc.
6. **Batter charging input** Use Solar panel charge the battery.
7. **Power Switch** Turn on when charging and discharging
8. **Load Indicator** It turn red when output is ok, Flash mean discharge request charge battery.
9. **Antenna** Adjust Antenna properly when tune in to FM radio

* Instruction for FM Radio & MP3

A. To play FM Radio & MP3



1. **Led Display** (show play model,Volume,play time and Channel band

2. **Prev** (Mp3 model short press to last song, long press to reduce the volume, Fast Reverse press 4 on the Remote controller;)

3.**Mode Switch Button** (switch between MP3-FM-AM radio)

4. **Next** (Short press to reach next song/channel, Long press to increase the volume)

5. **Turn on/off** (power switch)

6. **Pause/Search** (Press one time to pause, the second time to play again; Long press to search channels)

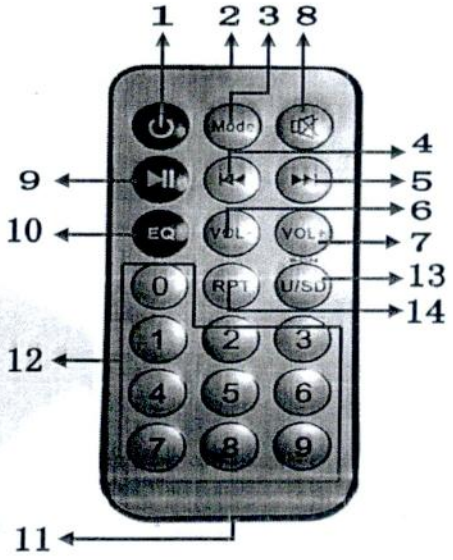
7. **Earphone Input**

8 **MINI USB Jack** (for connecting out device to play MP3 Audio resources)

9. **SD card Reading Jack** (To play MP3 Audio resources from SD Card)

10. **USB Jack** (To play MP3 Audio resources from USB devices)

B. Instruction manual for Remote Controller



1. **Main power switch button** (press this button to turn on / turn off the main power of FM radio and MP3)

2. **Infrared signal light** (Put remote controller toward the equipment's Infrared signal receiver within 5 Meters, please make sure the battery inside the remote controller is not out of power)

3. **Mode Switch Button** (To switch between FM radio and MP3)

4. **Back Button** (Press it to reach previous song/channel)

5. **Forward Button** (Press it to reach next song/channel)

6. **Volume Button -** (Press it to decrease volume)

7. **Volume Button +** (Press it to increase volume)

8. **Mute Button** (Press one time to be mute, second time to recover)

9. **Pause Button** (Press one time to pause, the second time to play again)

10. **Equalizer Button** (Press it to get the music style you like, such as normal, Rock, Classic etc.)

12. **Numeric Keys** (Press the digit to get the Songs serial No. or FM channel)

13. **Mode Switch Button** (To switch between U disk and SD