



EIE-06-256 REEPRO



Promotion of the Efficient Use of Renewable Energies in Developing Countries

Training equipment data sheet

Data sheet No.: 5

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Type of Equipment: (tick off the type)	PV	Solar Thermal	Biomass to Energy	
	✓			
Name:	Solar home system			
Location of the equipment:	Fix for training show which is installed at ITC, Department GEE			
Year of purchasing:	2008			
Operator: (Name and address)	ITC staff at laboratory ITC at Electrical and Energy Engineering.			
Planner: (Name and address)	ITC, Pochentong Blvd, Toul kok district, Phnom Penh			
Detailed description of the installation: (technology, function, benefit for training, etc. max 150 words)	<p>A 12V solar home system was installed at ITC. This systems consists of 2 PV modules with maximum output capacity of 150Wp (2x75Wp). A 70Ah-battery is used to store energy that is used for Lamp and fan when there is no sunlight or during the night time. A charge controller: with capacity of 12A is used for overcharge protection or overload protection of the batteries. The inverter converts the DC current to AC current which can produce the maximum output of 300W.</p> <p>The installation of SHS at ITC was done by the trainees of Level 1 course 4. The solar panels are installed on the roof of ITC which attached to a fixed stand. A DC cable from solar panel to charge controller is about 7m longer. The battery is placed nearby charge controller. The inverter connects to DC load port of charge controller. DC voltmeter, AC voltmeter and AC Ampere meter are used to measure current and voltage.</p>			
Generated Energy service: (tick off the energy type)	electricity	heat	gas	light
	✓			✓
Power output of installation: (kWel, m³ biogas, kW th, etc.)	150Wp			
Financing* (tick off the financing type)	private investment	loan	donation	grant
				✓
Investment costs in US\$*	1220USD			
Maintanance costs in US\$*	ITC has to remove battery every 3 years which costs 100USD			
Savings*	At ITC is mainly used for experimental only not for daily appliance used.			
Energy sale income in US\$*	N/A			
Comments	This system uses for experimental set up for the student at ITC every years in the field of Renewable Energy.			
Pictures and grafics	Solar Home System			

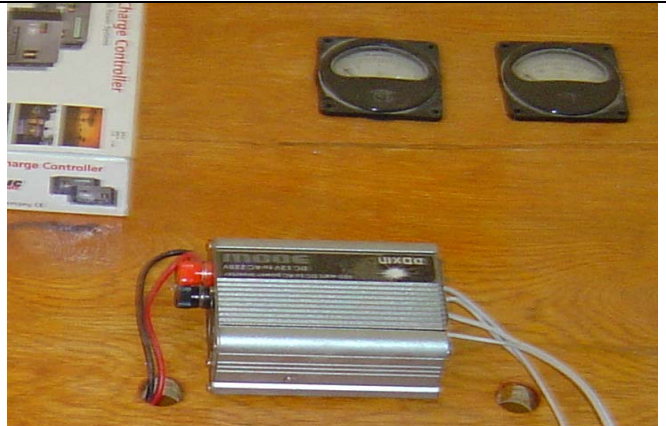
Solar panel with capacity of 150Wp (each panel 75Wp)



12/24V Charge controller of 12A with a DC voltmeter

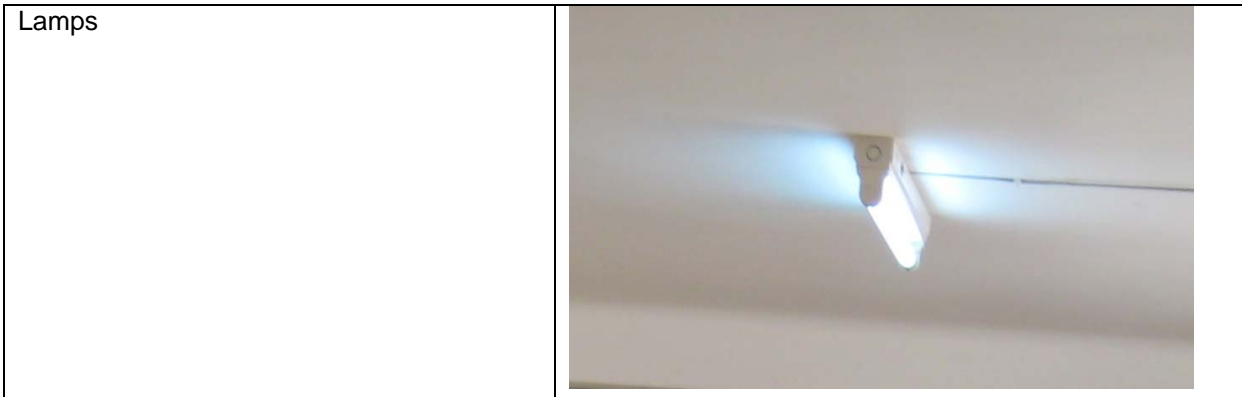


300W Inverter, with a AC voltmeter and a AC Ampere meter



Batteries of 70Ah





***Only when the equipment is used permanently**

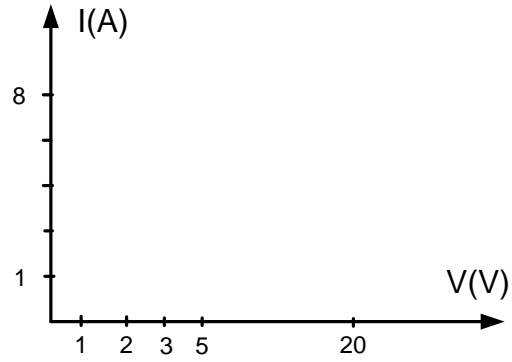
Possible practical exercises with Solar Home system at ITC					
Level 1 and Level 2 – Solar Home system at ITC					
1. Purpose of this exercise	Objective is to provide knowledge of designing system capacity and provide the skills in practical work of SHS, And I-V characteristics of PV Module				
2. Performance measurement of open circuit voltage (O.C.) and Short circuit current (S.C) of PV module	<table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%;"> </td> <td style="width: 50%;"> </td> </tr> <tr> <td>of open circuit voltage (O.C.)</td> <td>Short circuit current (S.C)</td> </tr> </table>			of open circuit voltage (O.C.)	Short circuit current (S.C)
of open circuit voltage (O.C.)	Short circuit current (S.C)				
3. I-V Characteristics Student can obtain I-V characteristic, by varying the Load Resistance R=[1 2 3 4 5.....50] ohm					

4. Results

From the table, student can draw I-V curve

Table for list down I(A) and V(V)

R(ohm)	1	2	3	4	5
V(V)					
I(A)					



I-V Characteristic curve