

Design of Small Solar Home System (SSHS)

Nominal system voltage: 12 Vdc.

Nominal system capacity: 10 Wp to 21 Wp

1. SSHS Design

Type: 1	Type: 2
System Capacity: 10 Wp to 15 Wp	System Capacity: 16 Wp to 21 Wp
Load Type: LED lamp (fixed) + 1 no. movable LED lantern (optional)	Load Type: CFL lamp (fixed) + 1 no. movable LED lantern (optional)
Maximum Load size: Should not exceed 50% of panel capacity	Maximum Load size: Should not exceed 50% of panel capacity
System autonomy: 3 days	System autonomy: 3 days

2. SSHS Component specifications

i. Photovoltaic Module

- Photovoltaic (PV) module must be tested and certified from an accredited testing and certification organization. PV module should have IEC/IEEE/PV GAP recommended certificates.
- Each module must be labeled with indicating at a minimum: Manufacturer, Model number, Serial number, Peak Watt rating, Voltage and Current at peak power, Open Circuit Voltage and Short Circuit Current.

ii. Battery

- The battery should be 12 Vdc
- Minimum size of the battery should be 18 Ah @ 10 hr
- Battery should be thick/tubular plate maintenance-free/vented type

iii. Charge Controller

- Maximum current handling capacity should be 5A

For more detail specification about testing of Charge Controller, see page number 11, article number 5.1 of Technical Specifications of Solar Home System (http://www.idcol.org/Download/TSC_Standard_TUES,%205%20July%202011.pdf);

iv. LED lamp /Lantern (Fixed/Movable)

For detail specification about testing of LED, see page number 13, article number 7 of Technical Specifications for Solar Home System; (http://www.idcol.org/Download/TSC_Standard_TUES,%205%20July%202011.pdf);

v. CFL (Compact Fluorescent Lamp)

- Maximum power output will be 5 W
- Rated voltage: 12V
- Minimum Lamp efficacy 45 lumen/Watt
- Rated efficiency of CFL will be over the range –2.5% to +20% of rated capacity
- Minimum striking voltage should be at least 90% of rated input voltage

- Maximum operating voltage will be at least 125% of the rated voltage
- Minimum operating frequency should be 20 kHz
- Electrical waveform will be symmetrical in time over voltage range of 11-12.5 Vdc at ambient temperature 25^o C.
- Maximum crest factor must be less than 2
- Inverter electrical efficiency must be greater than 80% from 11-13.3 V
- Inverter should have reverse polarity protection
- Inverter should have protection against open circuit voltage conditions. Maximum input current draw under open circuit voltage conditions should not be more than 100 mA
- Minimum life time should be 8,000 hours

3. Warranty

- **PV module:** PV module should be warranted for at least 20 years and must not be more than 20% of the rated capacity reduction in output over its warranty period.
- **Battery:** Battery should be warranted for at least 3 years.
- **Charge Controller:** Charge controller should be warranted for at least 3 years.
- **LED:** Each LED should be warranted for 3 years.
- **Built-in rechargeable battery for LED Lantern:** In case of movable lamp/lantern, built in rechargeable battery should be warranted for at least 1 year.
- **CFL:** CFL should be warranted for at least 1 year.

* Other technical standards (such as PV module installation, system wiring, system protection, monitoring, component documentation, operation and maintenance etc.) would remain as same as Technical Specifications for Solar Home System