How much solar power do you need?

System Load Calculation Worksheet for estimating your solar panel needs

(Thanks to Foster-Wills Alternative Energy for the original version of this)

Step1 Calculate your AC loads. If there are no AC loads, skip to **Step 2**.

Description of AC Loads Run by an inverter	**Watts**	X	**Hrs/Day**	=	WH/Day
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
line 1 -->			Total WH/Day		

2. Multiply line 1 by 1.15 to correct for inverter loss and battery efficiency.
   Multiply by larger number if not using pure sine wave or using an older inverter.
   (Example: Heart 1800 HF modified sine wave inverter/charger. Use 1.25 for loss.)
3. Inverter DC input voltage; usually 12, 24 or 48 volts. This is DC system voltage.
4. Divide line 2 by line 3. This is total amp hours per day, used by AC loads.

Step 2 Calculate your DC loads.

5. List all DC loads in the spaces below.

Description of DC Loads	**Watts**	X	**Hrs/Day**	=	WH/Day
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
		X		=	
line 5 -->			Total WH/Day		

6. DC system voltage. Usually 12, 24 or 48 volts.
7. Total amp hours per day used by DC loads. Divide line 5 by line 6.
8. Total amp hours per day used by AC loads from line 4
9. Add lines 7 and 8. This is total (estimated) amp hours per day used by all loads.

Solar Module Worksheet

This worksheet helps you figure the watt/hours (Wh) required for your system.

Note that only in optimum conditions will you get the full rated output of your solar panels. Clouds, shading, and sun angle will have a great effect on your average output. So you should assume 50-75% of rated output (in watts) during the actual sun hours of your location.

1. Total average amp hours used per day from System Loads Work Form, line 9

2. Multiply line 1 by 1.2 to compensate for battery charge/discharge loss (lead/gel/agm)

3. Average sun hours per day in your area

4. Divide line 2 by line 3. This is the amp hour (Ah) output required per hour from solar

5. Multiply line 4 by battery system voltage (12, 24, 48, etc.), this is your Wh required

6. Optimum or peak watts (Wh) of solar modules that you can fit onboard

7. Actual average Wh output: divide line 6 by .5 to .75 (depending on predicted cloudiness/shading), this is the actual predicted Wh output of your panels

8. Subtract line 7 from line 5: this is your deficit or surplus, in Wh's

9. Divide line 8 by your system voltage, this is your deficit or surplus in Ah's

If the size and number of panels you have chosen falls short of your daily power needs this will give you a good idea of how long you may need to run your engine/alternaor or generator, depending on your battery capacity (see below). You may also consider a wind generator in addition to solar to reduce your power shortfall.