SOLAR ELECTRIC LOAD SIZING WORKSHEET

Make a list of the appliances and/or loads you are going to run from your PV system. Find out how much power each item consumes while operating. Most appliances have a label on the back which lists the wattage. Specification sheets, local appliance dealers, and the product manufacturers are other sources of information. We have provided a chart which lists the typical power consumption demands of common devices which you can use as a guide. Once you have the wattage ratings, fill out the load sizing worksheet.

At this point, it is important to examine your power consumption and reduce your power needs as much as possible. This is true for any system, but it is especially important for home and cabin systems because the cost savings can be substantial. First identify large and/or variable loads (such as water pumps, outdoor lights, electric ranges, AC refrigerators, clothes washers, etc.) and try to eliminate them or examine alternatives such as propane or DC models. The initial cost of DC appliances tends to be higher than AC, but you avoid losing energy in the DC to AC conversion process, and typically they are more efficient and last longer. Replace incandescent fixtures with fluorescent ones wherever possible. Fluorescent lamps provide the same level of illumination at lower wattage levels. If there is a large load that you cannot eliminate, consider using it only during peak sun hours, or only during the summer. (In other words, be creative!) Revise your Load Sizing Worksheet.

POWER CONSUMPTION CHART

Estimated ratings for common appliances

APPLIANCE	WATTS	APPLIANCE	WATTS	APPLIANCE	WATTS
Coffee pot	200	Ceiling fan	10-50	Compact fluorescent	
Coffee maker	800	Table fan	10-25	incandescent equival.	
Toaster	800-1500	Electric blanket	200	40 watt equiv.	11
		Blow dryer	1000	60 watt equiv.	16
Blender	300	Shaver	15	75 watt equiv.	20
Microwave	600-1500	Computer		100 watt equiv.	30
		laptop	20-50	1/4" drill	250
Hot plate	1200	pc	80-150	1/2" drill	750
Washing machine		printer	100	1" drill	1000
automatic	500	Typewriter	80-200	9" disc sander	1200
manual	300	TV 25" color	150	3" belt sander	1000
Vacuum cleaner		19" color	70	12" chain saw	1100
upright	200-700	12" b & w	20	14" band saw	1100
hand	100	VCR	40	7 1/4" circ. saw	900
Sewing machine	100	CD player	35	8 1/4" circ. saw	1400
Iron	1000	Stereo	10-30	Refrig/freezer	
Clothes dryer		Clock radio	1	20cf (15 hours)	540
electric	400	Satellite dish	30	16cf (13 hours)	475
gas heated	300-400	CB radio	5	Sunfrost	
Water pump	250-500	Electric clock	3	16cf DC (7 hours)	112
		Lights:		12cf DC (7 hours)	70
		100w incandescent	100	Freezer	
		25w compact fluor.	28	14cf ff (15 hours)	440
		50w DC incandescent	50	14cf (14 hours)	350
		40w DC halogen	40	Sunfrost freezer	
		20w compact fluor.	22	19cf (10 hours)	112

List all of the electrical appliances or components which will be powered by your PV system. Separate AC and DC devices and enter them in the appropriate table. Record the operating wattage of each item. (See our Power Consumption Chart.) Specify the number of hours per day each item will be used. (If the amount is less than 1 hour, state it as a fraction of an hour. For example: 1 hour and 15 minutes would be entered as 1.25). Multiply the first three columns to determine the Watt-Hour usage per day. Enter the number of days per week you will be using each item to determine the total Watt-Hours per week each appliance will require.

DC Appliance/Component	Watts	X Qty	X Hrs/Day	= WH/Day	X Days/Wk	= WH/Wk

Add up the number in the last column. This is your DC power requirement for a week. WH/WK

Multiply by 1.2 to compensate for system losses during battery charge / discharge cycle. X1.2

AC Appliance/Component	Watts	X Qty	X Hrs/Day	= WH/Day	X Days/Wk	= WH/Wk

Add up the number in the last column. This is your AC power requirement for a week. WH/WK

Multiply by 1.2 to allow for inverter inefficiencies and system losses. X1.2

+

Add your total AC and DC load requirements together. This is your total power requirement for a week.

=

Enter the voltage of your battery bank (usually 12 or 24 volts)

÷

Divide your total power requirements number by your battery bank voltage. This is your amp-hour requirement per week.

=

AH/Week

Divide your weekly amp-hour requirement by 7 days. This is your average amp-hour requirement per day. This number will be used to size your battery bank and your PV module array.

÷ 7

Average AH/Day

From the choices below check the number of days of storage reserve you would like your system to support.

[ ] 0 (No backup) [ ] 1 - 3 Days (Non-critical) [ ] 4 - 7 Days (Slightly critical)

[ ] 8 - 12 Days (Critical) [ ] 13+ Days (Very critical)