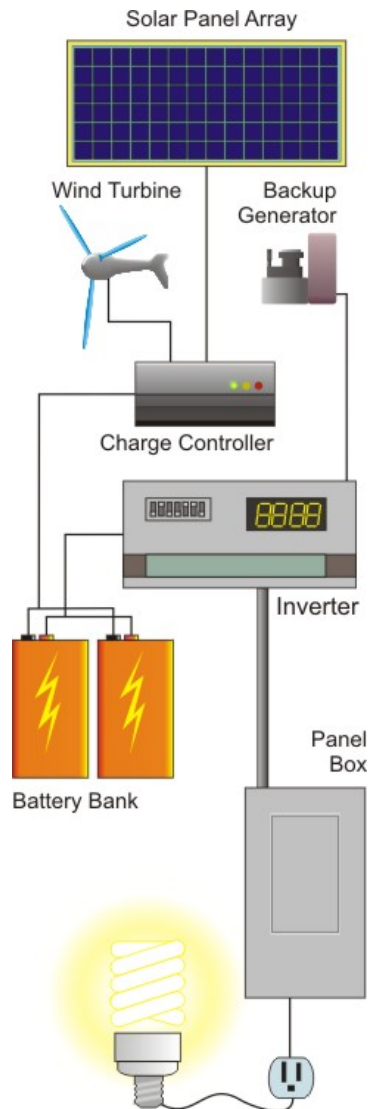


Off-Grid Solar and Wind Power System Design



Many homeowners today are concerned about pollution, greenhouse gas emissions and dwindling fossil fuels. A growing number of people in Saskatchewan would like to own sustainable and environmentally responsible homes. We design, supply and install solar and wind power systems, both off-grid and grid-tied.

A stand-alone off-grid solar and wind power system consists of a charging system, a battery storage system, a power conversion system and a backup generator. A block diagram of such a system is shown on the left.

Since the size and cost of a solar power system depends on the amount of power that you use, and on the amount of solar radiation and wind resources at your building site, it is important to design a system that will properly fit your needs. An off-grid system can range widely in price. For example, a small cabin system for weekend use could be around \$3000 or a system for an energy efficient year round home could range from \$35,000 to \$60,000 or higher depending on your needs.

We will design a system specifically for your home and provide you with a detailed quote, for a design fee of \$500, which will be applied as a credit against the total cost of the power system if you decide to purchase the system from us.

Design Process

Designing a power system starts with estimating the electrical requirements for your home. The Load Analysis Table on the next page lists many of the common mechanical systems and appliances in a home along with typical power ratings that you can use as a guideline. Please complete the table as best as you can by filling in the number of each of the listed appliances that you plan to have in your home in the "Number of Units" column. In the next column write down how many hours a day (on average) that you expect to have the appliance running. Will some appliances be used only for certain seasons? This Table will give us the basic information that we need to start designing a system for you.

1. Determining Your Power Needs

Load Analysis for a Home Solar Power System

Load	Power (W)	Number of units	Hours used per day	Energide Rating (kWh/yr)
1. Energide Rated Appliances:				
Fridge (rated at 404 kWh/yr)				404
Freezer				248
Washer (416 loads/yr)				227
Dryer (416 loads/yr)				398
2. Small Appliances:				
Kettle	1200			
Toaster	1200			
Coffee Maker	950			
Electric Frying Pan	1200			
Microwave	1300			
Slow Cooker	110			
Toaster Oven	1300			
Food Processor / Blender	350			
Can Opener	100			
Mixer	150			
Iron	1100			
Curling Iron	40			
Hair Dryer	1200			
Shaver	15			
Sewing Machine	75			
Central Vac	500			
3. Lighting and Fans:				
Lights - compact fluorescent	13			
Ceiling Fan	12			
3. Office and Entertainment:				
TV	100			
VCR	15			
DVD player	10			
Radio	40			
Stereo	20			
Laptop Computer	100			
Modem and router	40			
Printer	10			
Battery charger	10			

4. Mechanical Systems				
Water pump	1200			
Septic pump	800			
Radiant floor heating pump	75			
5. Tools and Automotive				
Small power tools	600			
Car block heater	1200			
6. Other Loads (please specify)				

Is this power system to be used for a year round home, or a seasonal cabin? If use is seasonal, how much time will you spend at the cabin – for example, weekends only, full-time for two or three seasons or weekends mostly with some extended periods?

2. Information About Your Building Site

The size of the solar array also depends on the amount of average solar radiation that you receive at your site throughout the year. If you have a good wind resource at your site a wind generator may also be an option. The following questions will help us to determine the size of your solar/wind power generating system.

1. Where are you planning to have the solar power system installed? (Name of nearby town, resort area, or other landmark)
2. What is the geographic location (latitude and longitude)?
3. Describe the terrain (flat, hilly, etc.).
4. Do you have trees in the surrounding area (deciduous or evergreen)?

Photos or a site plan that shows the topography and location of trees would be very helpful.

3. Information About Your House

1. Do you have a south facing roof on which solar panels can be installed. If so, is it facing true south, or how many degrees is it off of true south? What roof area is available for installation of solar panels? (If south facing roof is not available, panels will have to be pole mounted.)
2. Do you have a roughly 4 ft. by 4 ft. space available in your house for the battery bank, charge controller and inverter. The battery bank will need to be vented outside (above battery box), so some means of venting must be available (through the roof or through floor joists, or some other way). Indicate where this area is in the house, relative to the location where the solar panels will be installed (so we can estimate wiring that is required).
3. Do you have a shed available for the backup generator. The shed should be close to the house (to avoid long electrical cords between the generator and the house) but does not have to be insulated.

This information will give us a starting point for designing your renewable power system. After reviewing your Load Analysis Table we will probably have a few more questions for you and may make some recommendations for energy efficiency to reduce the capital cost of your renewable energy equipment. If you have any questions for us, please call Angie at 306-341-1151 or email me at angie@suncatchersolar.com.

We will then prepare a design and a price quote for you, with brochures and data sheets for the system components.

When you are ready for us to proceed with the power system design, please send the questionnaire and \$500 design fee. This is a non-refundable fee that will be applied as a credit against the total cost of the power system if you decide to purchase the system from us.

Your Contact Information: Name: _____

Address: _____

Email: _____ Phone: _____

Please mail your completed questionnaire and the design fee to:

**Suncatcher Solar Homes
Site 715, Box 58, R.R. 7
Saskatoon, SK S7K 1N2**

Or email it to angie@suncatchersolar.com

Thank you for your interest in our renewable energy systems.