



## SURVIVAL PAPER #SP90-8

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# THE SURVIVALIST AND SOLAR POWER

In 1988, Mr. Richard E. Oster, Sr., published this subject, "The Survivalist and Solar Power", and his article was finally accepted and printed by the Survival Papers Program in 1990.

In the 8 years since this paper came out, prices have gone down a little. Availability of parts and systems has increased thousand-fold. Many people are using solar power sources and others are thinking about using this renewable energy source for their own uses.

Suppliers and knowledgeable people have increased, and many new books have been written that explain in detail how to set up and size and buy the right system for your needs.

In this new edition of this subject, we will examine the new technologies that time has brought upon us; how the survivalist or the regular citizen might conceivably use these technologies; and lastly, the sources where these products and knowledge might be found.

## PHOTOVOLTAIC PANELS

There are basically two different kinds of solar cell panels. (photovoltaic panels)

The first is the traditional Crystalline glass-faced metal encased panels that most folks are familiar with. These traditional solar cells are usually single crystal, tempered glass fronts (to protect the solar cells behind the glass).

Even the Polycrystalline solar cells are considered traditional types of solar cells. These use similar crystals all joined together instead of one single huge crystal grown for one solar cell. The Polycrystalline solar cell is usually a bit less expensive to make and is therefore less expensive to buy. This type of solar cell does not have as high a power rating as the single crystal solar cells do. But, this is not usually a bad thing as for the money a person could buy more cells to make up for the difference in power output.

The newest type of solar panels is the flexible panel type of solar cell. These solar cell panels are very lightweight. They are flexible (they can bend and flex without breaking. Some can even be rolled up, the ideal for RV or for earthquakes), and they have a small bypass diode between every cell which makes them ideal for shady areas since the diode will prevent the battery from discharging. These diodes also provide protection against hail damage and other damage that might break or hole the solar cells.

These flexible panels usually do not have the high power rating that the older, more traditional types of solar cells do, but they are much more rugged and useful from a survivalist point of view.

Solar cells and panels come in all shapes and sizes, from the traditional mount-on-the-roof types to the more modern mount-anywhere types. Many solar cells are installed into watches, clocks, radios, flashlights and other useful items that a survivalist might find a need for.

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What might you as a survivalist want to use solar power for? How about using it to charge batteries so you will have a flashlight at night or for a cave. How about using a solar panel to charge or keep charged your vehicle battery, or with larger systems to power your house when the power goes off?

There are even solar powered walk lights that use the sun's energy during the day to provide a path with lights at night and solar motion detection systems that use the sun's energy to detect movement and to turn on a light.

## WINDMILL

Another form of solar energy is wind power. A windmill that uses the air currents to blow a windmill around which uses the motion to convert this motion to energy through the use of an alternator. This energy can then be used or stored. A windmill needs a steady 5 mph wind to produce electricity. If your area has this type of wind this might be something for you to consider. If your area does not have this amount of wind energy all the time, then check to see if it has it enough of the time for it to be worth your while to do this for your home.

I believe you will find that 60 to 70% of the time there will be enough time to justify the expense of a windmill. Hopefully, you will live in an area where the wind is good enough for this. If not, then do not worry. There are other methods of generating electricity.

## BATTERIES

With wind and solar cell panels, there are times when it is likely you will have more energy being produced than you can use. To prevent this energy from being wasted, you need to think of some way of storing it. The most common way to store energy is in a battery. Batteries come in various sizes, shapes, makes and models, from flashlight or radio size all the way up to vehicle and commercial sizes.

Batteries also come in various makes and models, from the old fashioned lead acid types to the more efficient alkaline batteries to the long lasting nickel-cadmium (NiCad) batteries, to the gel-cell sealed battery all the way to the chloride commercial batteries. The type of battery you select will be dependent on what you want to do with the battery. For instance, you would not choose an expensive chloride commercial battery for a flashlight, nor would you choose a cheap lead acid battery for your home power needs.

**PERSONAL POWER NEEDS** – By this, I mean small personal batteries, from AAA, AA, C, D up to 9volt batteries. In this range the choice of batteries is lead acid batteries, alkaline batteries or nickel cadmium (niCads) batteries. All three can be recharged a couple of times.

Lead Acid Batteries – As they discharge they get weaker and put out less power. In a flashlight they tend to fade into darkness. If you are using them in a walkie talkie, then you might only get partial life out of the battery since the walkie talkie quits working below a certain level of power. These batteries can be recharged from 3 to 12 times before they become useless.

Alkaline Batteries – These are a little better than the lead acid batteries above. They keep their power output at a higher level until just before they run out of power and they abruptly begin to fade and lose their power. This means you can usually get more work out of an alkaline battery before it needs recharging. These batteries can be recharged 10 to 30 times before they become useless.

Nickel Cadmium (NiCad) - These batteries are the battery of choice in these situations. Like alkaline, they keep their charge up until the end and fade abruptly. These batteries can be recharged for a number of years before losing their usefulness. **WARNING:** These batteries develop a memory so they need to be totally discharged before they are recharged to keep them producing the power levels they are

capable of. These batteries are good for flashlights, radios, clocks, electric razors, personal fans, portable TVs, clocks and a host of other personal items that might come in handy in survival situations (night vision, communications, i.e. walkie talkies, etc.)

## VEHICULAR POWER NEEDS

This is usually the first step towards making yourself independent from the power requirements of the Utilities. The power requirements of a vehicle call for more power than a person could carry. Try picking up your car battery. It is heavy. Most car batteries are lead acid types. The better ones are the golf cart type of batteries as they are more heavy duty than regular car batteries and produce the power that regular car batteries need. This means these batteries can be recharged and discharged time after time without injury to the battery. A good golf cart battery will last 3 to 5 years.

There are two solar cell panels that are on the market for you to consider. Both are of the flexible type of construction. One is a small battery maintainer that keeps a battery charged up. The second and most preferred type is the charger type that charges your car battery, as long as the sun shines on the solar panel. These panels can be affixed to your car, or if you are concerned, you can merely place it on your dashboard inside the car. To avoid overcharging your battery, you will probably have to have two or three batteries for your car. Two can be located in your trunk and these two batteries can be used for things like television for when you travel, DC appliances from electric heating elements for cooking things on, to tools being used with an inverter. One man I know has a trunk full of batteries that he uses for amateur radio use with solar cell panels for the roof of his car. His batteries are always ready and fully charged.

With DC (direct current) appliances and TV, there is little limit to what you can have or do with your vehicle; lights, blenders, hair dryers, heaters, fan, even refrigerators (i.e. Koolatron coolers and adapters for home and car), toasters and a whole host of items, electric skillet, etc.

These extras with the batteries and solar cell panels recharging system could make the difference between surviving and living.

## HOME POWER NEEDS

As you can see with the above, the power needs for a vehicle can be as complex as the power needs for a house. The biggest difference, though, is that homes use AC (alternating current) instead of DC (direct current). So this means that you have something to store this energy in, i.e., batteries. Then you need to convert this battery power to AC power through the use of an inverter.

With a house you can store more batteries since you do not have to worry with the weight slowing or weighing a car down. A house, after all, is much more stable and does not often move. So your battery bank can be much better and more powerful than what you might normally carry around. The four biggest power consumers of a house are: water pumping from a well, the use of the washer and dryer, the refrigerator, and the use of electricity for heating and cooling. You should consider converting heating and the refrigerator use to propane gas. This is much more economical than electrical use. Or, get an energy efficient model like the Sun Frost models. Hand washing and air drying laundry can eliminate the energy requirements for the washer and dryer. Water pumping is the only electrical use left and this is usually acceptable after you have reduced the electrical needs mentioned above.

Lighting, cooking, TV and computer usages can all be accommodated using minimal solar cell panels. The ability to have power when your neighbors do not is an attractive ability and can mean the difference between your survival in a difficult situation or your demise.

If you do not use an inverter for your whole house, you will need to duplicate your appliances and equipment so you have items to work with AC power and with DC power sources. This is a needless duplication and inverters are well worth the trouble and effort required.

Do not forget emergency power generation in the event of extended bad weather. A generator to provide power must be considered a necessity in the event of an emergency. Batteries do not last forever. Remember, safety first! Batteries often give off hydrogen gases when charging, so these gases must be vented outside or you have a fire hazard in your home.

## SOURCES

### Solar Panels and Windmills

SUNELCO  
P.O. BOX 1449  
100 SKEELS STREET  
HAMILTON, MT 59840-1499

KANSAS WIND POER  
ROUTE 31 BW 24  
HOLTON, KS 66436  
(913) 364-4407 \$4 CATALOG

CARRIZO SOLAR CORP.  
1-800-776-6718  
(505)764-0345

AMERICAN SUNCO  
P.O. BOX 789 B  
BLUE HILL, ME 04614  
(207)374-5700

UNI-SOLAR  
SOLARMODE  
1-800-244-2443

LAKE MICHIGAN WIND AND SUN  
E. 3971 BLUEBIRD ROAD  
FORESTVILLE, WI 54213  
(414)837-2267

TRILLIUM WINDMILLLS, INC.  
RURAL ROUTE #2  
ORILLIA, ONTARIO  
CANADA 3V 6H2  
(705) 326-6513

WIND TURBINE INDUSTRIES CORP.  
16801 INDUSTRIAL CIRCLE S.E.  
PRIOR LAKE, MN 55372  
(612)447-6064

ABRAHAM SOLAR EQUIPMENT  
P.O. BOX 957

PAGOSA SPRINGS, CO 81147  
1-800-222-7242

FOWLERS SOLAR ELECTRIC, INC.  
P.O. BOX 435  
WORTHINGTON, MA 01098  
(413)238-5974 \$3 CATALOG

INTEGRAL ENERGY SYSTEMS  
109 McARGALL WAY  
NEVADA CITY, CA 95959  
1-800-735-6790

UTILITY FREE, INC.  
P.O. BOX 228  
BASALT, CO 81621  
1-800-766-5550

NORTHERN  
P.O. BOX 1499  
BURNSVILLE, MN 55337-0499  
1-800-533-5545

### Generators

NORTHERN  
P.O. BOX 1499  
BURNSVILLE, MN 55337-0499  
1-800-533-5545

CHINA DIESEL IMPORTS  
15749 LYONS VALLEY ROAD  
JAMUL, CA 91935

SELF-RELIANCE COMPANY  
P.O. BOX 306  
FLORISSANT, MO 63032  
CATALOG \$6

ASTRODYNE CORP.  
412 HIGH PLANE ST.

WALPOLE, MA 02081  
(508)668-3211  
FREE CATALOG

REAL GOODS  
966 MAZZONI ST.  
UKIH, CA 95482-2471  
1-800-762-7325

ALTERNATE ENERGY ENGR. INC.  
P.O. BOX 339  
REDWAY, CA 95560  
1-800-777-6609 (707)923-2277

THE STEAM OUTLET  
P.O. BOX 1426  
THONOTASSASSA, FL 33592

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### Books to Consider

THE NEW SOLAR ELECTRIC HOME, by Joel Davidson. Published in 1990, it has 408 pages and costs around \$20.

THE SOLAR ELECTRIC HOUSE, by Steven Strong. Published in 1993, it has 276 pages and costs around \$20.

THE SOLAR ELECTRIC INDEPENDENT HOME BOOK, by Paul Jeffrey Fowler. Published in 1993, it has 174 pages and costs around \$20.

WIND POWER FOR THE HOME AND BUSINESS, by Paul Gipe. Published in 1993, it has 414 pages and costs \$35.

SOLAR LIVING SOURCEBOOK, by Real Goods staff. Has 656 pages and costs \$30. Published annually.

