Battery Types for Alternative Energy, homemade solar systems and DIY wind generators. Part Three:

Types of Battery storage for DIY Solar panel systems and homemade wind generators for alternative energy systems

July 12, 2009 - *PRLog* -- Types of Batteries for Alternative Energy Storage

Alternative Energy Storage-Part Three:

Technology for batteries for alternative energy systems of all types is advancing rapidly. There are new breakthroughs in battery storage technology nearly every month. The future will see some great innovations becoming available and affordable to the public in the way of energy storage systems. For now we are going to discuss the most common, user friendly and affordable batters used in homemade solar and DIY wind generator situations.

Lead-Acid Batteries
Lead-acid batteries are the most common in homemade solar or DIY wind energy systems because their initial cost is lower and because they are readily available nearly everywhere in the world. There are many different sizes and designs of lead-acid batteries, but the most important designation is whether they are deep cycle batteries or shallow cycle batteries.

Shallow cycle batteries, like the type used as starting batteries in automobiles, are designed to supply a large amount of current for a short time and stand mild overcharge without losing electrolyte. Unfortunately, they cannot tolerate being deeply discharged. If they are repeatedly discharged more than 20 percent, their life will be very short. These batteries are generally not a good choice for an alternative energy system.
Deep cycle batteries are designed to be repeatedly discharged by as much as 80 percent of their capacity and as such, are a good choice for alternative power systems. Even though they are designed to withstand deep-cycling, these batteries will have a longer life if the cycles are shallower. All lead-acid batteries will fail prematurely if they are not recharged completely after each cycle. Letting a lead-acid battery stay in a discharged condition for many days at a time will cause sulfation of the positive plate and a permanent loss of capacity.

Sealed deep-cycle lead-acid batteries are maintenance free. They never need watering or an equalization charge. They cannot freeze or spill, so they can be mounted in any position. Although they are more expansive, we recommend sealed batteries for remote, unattended solar panel or wind generator power systems and for the homeowner who desires the maintenance free feature yet doesn't mind the extra cost associated with these batteries.

Sealed Gel Cell (gelled-electrolyte) batteries are relatively maintenance free, however unlike a high quality sealed lead-acid battery, extra care must be taken to insure a Gel Cell battery is not charged above 14.1 volts (for a 12 volt battery). Over charging a Gel Cell even once for a sustained period can compromise its effective life and possible destroy it completely. Any charge source or charge regulator used for sealed Gel Cell battery charging must have user adjustable settings to insure charge voltage does not exceed a safe limit. Make certain to check manufacturer’s recommendations before charging to insure you do not overcharge.

Caring For Wet Cell Lead-Acid Batteries

Wet-cell, lead-acid batteries require periodic watering and equalization. Always use extreme caution when handling batteries and electrolyte. Wear gloves, goggles and old clothes. "Battery acid" will burn skin and eyes and destroy cotton and wool clothing.

The quickest way to ruin lead-acid batteries is to discharge them deeply and leave them stand "dead" for an extended period of time. When they discharge, there is a chemical change in the positive plates of the battery. They change from lead oxide when charged to lead sulfate when discharged. If they remain in the lead sulfate state for a few days, some part of the plate does not return to lead oxide when the battery is recharged. If the battery remains discharged longer, a greater amount of the positive plate will remain lead sulfate. The parts of the plates that become "sulfated" no longer store energy. Batteries that are deeply discharged, and then charged partially on a regular basis can fail in less than one year.

Check the batteries on any alternative energy system on a regular basis to be sure they are getting charged. Use a hydrometer to check the specific gravity of your lead acid batteries. If batteries are cycled very deeply, (which often happens in a solar electric or wind power system), and then recharged quickly, the specific gravity reading will be lower than it should because the electrolyte at the top of the battery may not have mixed with the "charged" electrolyte. Check the electrolyte level in wet-cell batteries at least four times a year and top each cell off with distilled water. Do not add water to discharged batteries. Electrolyte is absorbed when batteries are very discharged. If you add water at this time, and then recharge the battery, electrolyte will overflow and make a mess.

Keep the tops of your batteries clean and check that cables are tight. Do not tighten or remove cables while charging or discharging. Any spark around batteries can cause a hydrogen explosion. This can be very dangerous and cause serious injury in addition to destroying the battery.

It is a good idea to do an equalizing charge when some cells show a variation of 0.05 specific gravity from each other. This is a long steady overcharge, bringing the battery to a gassing or bubbling state. Typically, we'll recommend an equalization charge at least once a month. Do not equalize sealed or gell type batteries. With proper care, lead-acid batteries will have a long service life and work very well in almost any DIY solar or Wind generator power system.

This completes our three part series for Alternative Energy Storage. These basic facts will be useful no matter what type of system you develop. We will be posting article in the future about new battery types and how to best use your energy storage capacity to maximize performance and longevity.

Thank you to Advanced Energy Group,llc Conroe, TX for information and technical content in this article. (Source) http://diyenergyusa.com/energyblog/products/

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How to Lower Your Energy Bill Through Alternative Energy Sources!

Live off-grid by using Wind Power and Solar Panel Systems!

Save money on your power bill every month by 95% by learning how to make your own solar systems for just under $200.

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