Going Off-Grid *(745 words)*

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Every time I tell someone that I live "off the grid", they look at me with a mixture of confusion and disapproval. "You don't have electricity?" they ask. "I don't ***buy*** electricity," I respond, and I begin my routine of listing the appliances in my home. They know about solar panels, and some have even heard about hydroelectrics, which is where most of my power comes from. But you can't really understand home power by talking about it. You've got to spend some time living off-grid.

I didn't design the power system in my house, but I've spent lots of time cursing the guy who did. He lives next door, and his home-power system (built after he learned how by building mine) is a model of reliability. I know this because whenever I walk by he's finishing up another new addition on his house, power saws buzzing and stereo turned up loud. He draws power from the biggest battery I've ever seen: a single 24-volt, 1-ton "gel-cell" monster. It stores enough power for several days of use, allowing him to do maintenance on his hydro generator without a care in the world. When my hydro system goes down, my tired old batteries run out of steam the same afternoon. I can conserve and get by on sunshine, but life isn't good again until the hydro is back on-line.

When you generate your own power, there's an unavoidable connection between your state of charge and your state of mind. If I wake up in the morning, for instance, and hear the gentle singing of the charge controller, I know the battery bank has fully recharged overnight and we're both ready to greet the new day. On the other hand, an eerie silence is indicative that I will spend the morning standing in the creek pulling muck out of the hydro's intake screens. Lately my system has been singing a lot, and we're really quite happy with one another.

A properly designed home-power system requires only minor maintenance, but the convenience of utility power keeps most people from even considering it. So why choose to live without the grid? One surprising reason is economics: In areas where homes are built one-half mile or more from existing power lines, installing a renewable power system can be cheaper than signing up with a utility. But beware of the myth that electricity from renewables is "free". The maintenance costs on a renewable power system are typically higher per delivered kilowatt-hour than utility power. This is due to fatigue of the storage batteries, which usually require replacement before they have delivered enough power to compete with utility prices.

The most compelling reasons to live off-grid are environmental. With 70% of U.S. electricity still being generated by burning fossil fuels, there's a real opportunity to reduce emissions from power plants. Powering a single home with a solar, wind, or hydroelectric system saves enough energy to offset the emission of up to 2 tons of carbon dioxide annually. (Carbon dioxide is a known contributor to global warming). Americans have a long way to go toward conservation -- we consume twice the electrical energy per person versus Japan, and to generate it we produce nearly four times more carbon dioxide than any other country.

If you're interested in renewable energy but aren't ready to live off-grid, you may want consider a grid-connected home power system. New "net metering" practices, now used in fourteen states, make this option more attractive than ever. With net metering, the customer's power meter actually runs backward as power is fed onto the grid. (Previously, utilities required power producers to have two separate meters, one for buying the power from you at wholesale, the other for selling it back to you at retail). In addition to reducing electric bills, net metering makes the grid an efficient, economical alternative to batteries for storage of power.

Whatever level of involvement in renewable energy you settle into, you can look forward to rapid development as the industry really gets moving in the next decade. But if you want to experience real independence, and feel proud every time you pull the trigger on your chopsaw, move off the grid. And when a winter storm hits and the surrounding area loses power, just brush the snow from the solar panels, clean the heads on the VCR, and check that your pantry is well stocked. You can bet they'll be coming over to ***your*** house tonight.

Mark Sardella is a Mechanical Engineer and a Consultant to the renewable energy industry. His hydroelectric systems have been featured on CNN's "Earth Matters".