



# The Adventures of “Private Power”

By Steven Moore



## Barn Wars

We have a secondary solar power system in our barn to run lights, the electric pig fence, a tractor block heater and the occasional power tool such as sheep shearers. Some of my favourite times are in that barn on cold winter nights with the lights on and the sheep or cattle contentedly munching hay. It feels so cozy.

The system was planned to contain twenty 1.2 volt NiCad batteries arranged in two parallel strings of ten to give me 12 volts and double the amp hours from just one string. But some of the batteries were far below the voltage of the others, so I couldn't hook them all up because the current flow as they tried to equalise each other provided Canada Day fireworks. So that left one string of 10.

NiCads were perfect for the rough job since they can stand freezing and can't really be overcharged except through complete neglect and Sahara sun. No chance of that in Ontario. The sun provided power through one 30-watt solar panel and, when we upgraded the house system, we moved the old 600-watt inverter from the house to the barn. Hard to believe it once powered the whole house.

The arrangement worked pretty well, although the 10 batteries had trouble keeping up to the fencer in the fall when the sun decreased and the hogs leaned their three hundred pounds against the fence, always testing for any flaws in our security system. Some of the NiCads were 40 years old and performed like me - creaky and stiff and less than optimal. Too weak for pigs with roving intentions.

When we finally upgraded the house batteries, I saved the best 20 to replace the tired ones in

the barn. After hauling 80 batteries in 200-pound boxes of four out of the house, we slugged the best 20 NiCads to the barn, unhooked the barn bank, and grunted the old boxes out and the new in. I didn't label the positive and negative inverter cables when I unhooked the first string but that was fine. I was sure which was which. It was a long day and I decided to hook them up later.

That weekend my teenaged son was home from his girlfriend's, rock band practice, skate boarding, and general goofing around. I thought hooking up the new batteries would be a good project for us to do together. After taking our rings off, I showed him how you could touch a 12-volt system and not get a shock like from 110 volts. As long as you don't drop a metal wrench across the terminals and unleash the melting force of 220 amps, 12-volt batteries are fairly safe. I'm always a bit nervous and very careful handling batteries anyway, but this was also an opportunity to show him that private power could be accomplished safely and efficiently if you followed a few simple steps.

We unscrewed all the connectors from the old batteries and hooked 10 in series - positive to negative to positive, etc. - so they would add up to 12 volts. I have a ratchet wrench with the right fitting and a foot-long length of plastic pipe that is my torque gauge. When the plastic bends just this much on tightening, I know the torque is right.

We double-checked each connection and put our battery tester on the ends of each string to check the voltage - 12.4V - pretty good. First string done, and we finished the second string

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the same way. We connected each string's positives at one end and the negatives at the other end to run the strings in parallel and double the capacity, then checked the voltage again. Perfect.

Last, we bolted the positive inverter cable to the positive battery end and the negative inverter cable to the negative battery end. I probably said something like, "See, this isn't too hard if you pay attention and take it step by step" as I pushed the DC breaker on to run battery power to the inverter.

The inverter voltmeter flattened itself to the zero edge of the scale like a bug on a windshield. Oh, oh. I threw the breaker off but not before there was a burning smell followed by a few wisps of smoke from the inverter.

As I stared in horror, my son asked innocently, "Is it supposed to do that?"

No son, it's not.

In my supreme confidence and failure to properly label the cables, I had reversed the current going to the inverter - hooked the positive inverter cable to the negative battery terminal and vice versa. We had no choice but to reverse the cables to see if there was anything left of the inverter. We did and there wasn't. Not a flicker of life. I muttered a steady stream of cuss words under my breath, words I'd never let him get away with saying in front of me.

We packed our tools and trudged up to the house. He didn't seem too concerned but my day was pretty much ruined. I could have kicked myself up the hill, I was so sure I knew which cable was which.

To top it off, my brother-in-law electrician who did all the barn wiring was coming over for dinner the next day. As soon as he arrived I confessed my stupidity and asked him to double check which cable was which. We went

down to the barn and immediately identified the right cables - the opposite of what I had thought. We hooked them up properly but the inverter was dead as roadkill. I asked him if the damage was permanent and he said it was unless the inverter had a fuse that prevented reverse polarity current from reaching its guts.

All the time, this little voice in my head was whining, "Why didn't you wait just one day. Then you would have gotten it right."

A call to the inverter distributor was met with a low whistle and the comment, "Wow, that's an old model. I didn't think there were still any of those around." Not a good sign. It seems that little box was made long before anyone thought to put in fuse protection for dummies like me. I ordered another 600-watt inverter. \$500. The cost of one day's over-eagerness.

Our solar expert, Jason Elliot, was my last hope. When he came out to hook up the new inverter, he said, "Yeah, those old models never had any protection, some still don't. It could either be a 75¢ diode or the whole thing is fried. I'll take it home and have a look."

He told me things like that happened all the time and the only way to prevent them was to do nothing at all. Not really much of an alternative, I suppose. But, as I wait for his diagnosis, I'm still hearing that little whiny voice "Why didn't you wait just one day. Then you would have gotten it right."

Producing your own power is unquestionably rewarding; economically, environmentally, and because of the great satisfaction gained from personal reliance and independence. In that sense I was right - it isn't too hard if you pay attention and proceed step by step but, in my barn wars, overconfidence and impatience created a Waterloo for Private Power.

***Steven Moore and his family farm off-the-grid in Eastern Ontario***