

Above: The Phelps' solar-powered home in the Western Colorado Rockies.

Not Much Different

Patti Penland Phelps

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"Hi, I'm so glad to see you! Come in and have a cup of coffee."

This rather routine greeting may not sound significant, but to me it means a lot. It means that I can fix a cup of coffee in my favorite Oster drip coffee pot and can enjoy my friend's visit. Making coffee with an electric coffee maker is monumental because all our electricity comes from the sun. We use photovoltaics to provide power to batteries that give us electricity to operate our household.

In the Beginning

Two years ago my husband, Frank, and I made the decision to build on rural property we own in the Western Colorado mountains. Frank was planning to retire from the FBI and we were finally going to see a dream come true. The first shock came when we found that to bring public service electricity the three miles to our land it would cost \$60,000. Both of us have been interested in alternative energy but we had thought of it as supplemental. Now we knew that it had to be our primary source of power.

We began researching everything possible about alternative energy. A small creek runs across our land so we looked at hydro power. Winds gust in this area so we looked into windmills. Western Colorado has almost 300 days of sunshine so we looked into solar power. Finding information that we could understand was a nightmare. When the energy tax credits ended, in 1985, many of the companies producing alternative energy systems closed. Most books and magazines dealing with the subject had been written in the 70s and had become outdated and lacked information on the newest technology. Then a friend suggested that we contact the Solar Technology Institute (formerly Colorado Mountain College Solar Program). This resulted in an upturn in our fortunes. We found that this solar program, run by Johnny Weiss and Ken Olson, was a leader in the United States in solar technology. They had a class beginning in the fall and would consider our home for a class project.

Schools in

In September Frank and I were invited to the class to discuss our plans and needs. We took our floor plan and talked with the 15 students about our dream. The students included 18 year old youths fresh from high school and older adults eager to learn new skills to improve their careers. One woman was a building inspector from New York and another student was from South America. They shared an enthusiasm for using alternative energy and an idealism which was contagious.

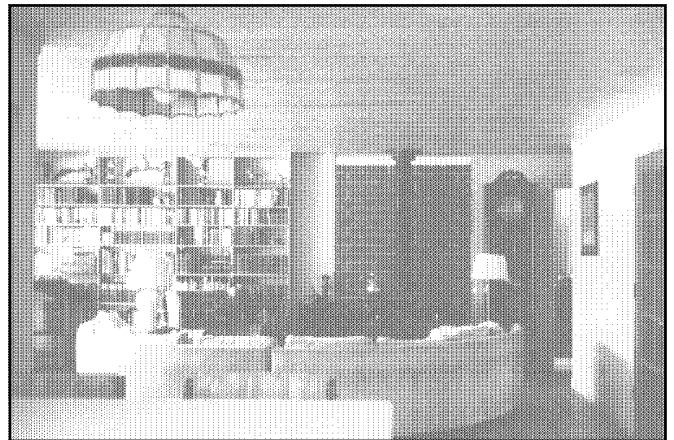
The first thing they did was to question us about our utility use in our normal, city life style. We gave detailed lists including little items like the curling irons up through the coffee pot. These idealistic students then took our lifestyle and began to compute our use of electricity. If you have never done this, it is an exercise that makes you aware, in a very personal way, of how much of the earth's resources you are using and, what is more important, how much you are wasting. The students took each appliance and discussed the watts, amps, volts, and phantom loads. This was where they began to lose me but the most important thing I learned was that heat using appliances like hair dryers, and coffee makers use a ton of electricity.

Costs

The students met with us a few weeks later and they recommended a large solar system which would have cost about \$15,000. Frank and I took the list and pared down some of the appliances that we really didn't need. Working with the class and within our budget, we decided on a PV system incorporating 12 panels and 8 batteries with a total of 700 amp-hours at 24 volts. We would have enough electricity for four days and if the batteries needed charging we could use a generator as a backup. I was told by everyone repeatedly that this was a small system and I would have to practice "load management". I had visions of carrying a flashlight in my pocket in the event that I turned on the one electric appliance that would overload the system and everything would go out.

Installation

Purchasing our system was made a great deal easier because one of the largest solar companies, Photocomm, has an office in Denver. The system arrived in the spring of 1990 and Johnny Weiss brought the students up to install the system. We wired the house with a dual system; 110 vac outlets for regular electric uses and 24 Volt DC for a few special uses such as the refrigerator, water pumps and a couple of lamps. The only visible signs of the two systems are the solar panels on the roof, the two breaker panel boxes side by side and several



Top: Frank & Patti Phelps with Juan Livingstone (center) and Davis Chapell (center left). Juan and Davis are STI Solar Program graduates.

Center and Bottom: the Phelps' living room and kitchen.

funny looking outlets.

Graduation

Within two days Johnny Weiss, and his crew of students had electricity in our house. We built the house ourselves and it was an exciting moment to turn on a light and the stereo. Now we have lived with solar power for almost a year and I can say it's the best thing we've done. People often ask me what it's like to live with solar power. I find that I never leave a light on when I leave a room, but I don't hesitate to turn on as many lights as I need when I'm in a room. We bought two new low voltage bulbs from Rising Sun (a light company that specializes in alternative lighting with incandescent lights). These lights give the same amount of light in the same warm tones that the grocery store bulbs give but use just a fraction of the amount of electricity. I still use my sewing machine, word processor, hair dryer, vacuum cleaner, and Cuisinart food processor. I use the 1000 watt microwave with more forethought than I did in town. I play the stereo all day and much of the evening. We watch TV and movies on the VCR. I can honestly say that our lifestyles have not changed because of solar other than that we think about our power use and don't waste electricity.

Changes

We did make three changes that city households wouldn't have to make. We installed a gas clothes dryer, the

washing machine is electric and on sunny days I may run as many as 5 loads of wash. We also purchased a new superinsulated 24 Volt refrigerator that runs on much less electricity than a conventional refrigerator. I cook on a gas stove that uses a gas pilot light rather than electric coils.

This winter we learned that the short cloudy days of December and January were the only times we used the generator for backup power; a total of 20 hours for the two months.

Conclusion

We moved to the country a year ago and I must confess that I was concerned about leaving city power and living off the grid. It has not changed our lives and now when friends visit I can relax and enjoy a cup of coffee with them.

Things like volts, amps, and watts still confuse me but I've learned that you can live with solar energy without understanding physics. We are fortunate to have Johnny Weiss and Ken Olson as experts nearby. Johnny and Ken's school, the Solar Technology Institute is a private non-profit school. They will continue to be a leader in the field and a resource for all of us who live off the grid.

Access

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