

Power With Nature

– UPDATED 2ND EDITION –

Alternative Energy Solutions
for Homeowners

Rex A. Ewing



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Prologue

Every once in while the world actually *does* change for the better. It is in such times that self-reliance triumphs over dependence, and initiative supplants “the way things have always been.” For those riding the crest of the wave, it’s a heady feeling. This is what’s happening right now with renewable energy. Every day more and more people realize how sensible it is to harvest their own energy from the sun and wind, and in the process the giant power plants are belching just a little less smoke.

But it’s not the time to get all starry-eyed—not yet, anyway. Like most revolutions, this one is driven as much by profit as ideals; as much by practical considerations as by earth-saving philosophies. Each is a necessary element: profit and practicality are the powerful motivators that fuel the fires of change, just as ideals and philosophies are the winds that keep them burning—hopefully—in the right direction.

This is not a save-the-planet book. I’m not much good at saving planets; I can’t even figure out how to keep noxious, flatland weeds from invading my mountain meadow. No, this is a roll-up-your-sleeves-and-install-a-productive-solar-and-wind-system book. My goal is simple: to show you what renewable energy is all about, so no one profits too much at *your* expense.

If you are reading these words, it’s because you have developed more than a passing interest in renewable energy. Probably you are seriously considering installing some sort of system, and you’d like to know as much about it as possible before handing over hard-earned cash to someone who might’ve been a snake oil salesman in a bygone age.

The beauty of a book is that you can learn from someone who has learned the hard way, but has no desire to sell you thousands of dollars

worth of components and equipment. That way, when it does come time to make the plunge, you'll know your money is being well spent.

In 2002 my wife, LaVonne, and I penned a rather large book titled *Logs, Wind and Sun* in which we detailed our two-year endeavor to build a log home and power it totally—electrically speaking—with homegrown power from the wind and sun. We drew heavily from our own inventions, successes, missteps and adventures, but, because most people's true-life experiences are seldom broad-based enough for those seeking a firm foundation of general knowledge, we thoroughly researched every aspect of the book to make it as useful as it was fun to read.

Since it was released, *Logs, Wind and Sun* has been well-received, both by log home enthusiasts and those involved in renewable energy. But, while most readers on the log home side of things thought the renewable energy aspect offered a fresh new direction, many on the other side of the fence found all the talk about log homes to be a trifle confining. Why not, they suggested, write a book that nixed the logs and emphasized renewable energy?

Why not, indeed?

Thus *Power With Nature* was born. It is a book written in two parts. Part one, *Dog of the Sun—Cat of the Wind*, is a primer; a primer disguised as a fable, to be precise. In this fable the human protagonist—me, as it turns out—finds himself caught up in the maelstrom of the renewable energy revolution. Though all he really dreams of are normal pets, the Perfect Woman, and a simple, functional solar pond-pump system, he finds himself in the vanguard of a nature-driven revolution.

That is the fable part. Along the way, as you may have guessed, he learns the rock-bottom basics of solar and wind energy systems. This is the primer part.

Why the fable?

Because for most of us, a good fable lodges itself in mental nooks and crannies that boring expositions of facts can't. Take Brer Rabbit, for instance. Of all the teachers I've had in my life, Brer Rabbit has stuck with me the longest. He was one hare who knew how to get out of a tight spot; a master of manipulation, a practitioner of the devilish powers every child craves to possess in all of their cabalistic intricacies.

I loved him so much because I grew up in a time when big kids had no compunction about beating up on little kids. It was the way of the world. A kid had to be tough or clever, or both, to survive. Brer Rabbit taught me that, when all else failed, a bluff was a pretty good alternative to getting pulverized. He also taught me that large thickets of thorny vegetation—Russian olive trees, in my case—were great places to slither away from big kids, after bombarding them with snowballs.

By the time Nature's ever-burgeoning dictates pulled my attention toward other things, my little Brer Rabbit book was so faded, wrinkled and dog-eared it was hardly readable.

Everyone has their own fables. Maybe for you it was *The Three Little Pigs*, or *The Little Boy Who Cried Wolf*. I personally learned the fundamentals of sound building practices from the former, and when to keep my mouth shut from the latter.

Where else can a kid learn these things?

No one remembers how they learned their multiplication tables, or how they learned to read and write; these are skills that were hammered into our hardly-willing little brains by rote—day after day, week after week, year after year. But every kid remembers *Little Red Riding Hood* in all its lurid splendor.

That's because fables are *fun*. They fire the imagination to the same degree that evil-eyed teachers douse it. They stick in our minds long after we forget the product of 9 times 13 (quick! what is it?), or if the vowel preceding a double consonant is long or short.

So, for every grownup among you who, like me, still appreciates the power of a good story, *Dog of the Sun—Cat of the Wind*, is a quaint but instructive yarn; one where animals act in unnatural ways, and Nature loves them all the more for it.

Then there's part two, *Beyond the Grid*, where we'll actually dig into the mountain of knowledge we touched on in the fable. Intimidating as the subject may seem, it really isn't. That's because—unlike Quantum physics, or English Lit—it all makes sense. Besides, it's a necessary element. As great a teacher as ol' Brer Rabbit might have been, he didn't know beans about readin', 'ritin', and 'rithmetic, and if Missus Horseface hadn't taught you and me all that stuff, you wouldn't even be reading

this. So hang in there; you're about to learn a lot of wonderful things that will change your life for the better.

Beyond the Grid delves into every aspect of using available, off-the-shelf solar, wind and micro-hydro technology to power all or part of your home, whether you live in town hooked to the power grid, or so far out of town you can't even recall where the last power pole stands, lonely and unappreciated. All the components you will hear about in the fable will be covered in detail here. You'll learn how everything goes together; how each component works with all the others. Most importantly, you will be amazed at the natural logic of it all—you will actually feel like this renewable energy thing is a doable enterprise.

For those of you who are building new homes in remote places, I'll discuss design considerations, heating and cooling options, and the best ways to get water out of the ground and into your house. I consider many of the options available though, admittedly, I do a poor job of hiding my preferences.

So sit back and enjoy the book. And don't despair. I'm not an academic. Though I relied heavily on my formal education to produce *Power With Nature*, I'm really just a guy who graduated from the Academy of Fairy Tales and enrolled in the School of Hard Knocks.

— Rex A. Ewing, 2003

Preface to the 2nd Edition

As I dove into the revisions for the second edition of this book, I kept the old adage, *if it ain't broke, don't fix it*, firmly in mind. I had no intentions of changing anything that didn't need to be changed, or rewriting any parts of the text that are as valid today as they were three years ago when *Power With Nature* first came out.

But some things simply *had* to be revised. Many companies mentioned in these pages have since changed their names or their products, and some new players have entered the game. Grid-tied solar systems have grown in popularity and thus deserve a stronger mention. And, of course, I have heard from many readers of the first edition who said, "I really loved your book, but why didn't you discuss...(fill in the blank)..." Good points, all. So I've added a lot of new things in this new edition. (Ever wonder how you could use sunlight and wind to make hydrogen to power your house? Keep reading.)

I've also beefed up the chapter on wind energy and included a thorough explanation of how solar cells really work. And, since we're charging a whole nickel more for this edition (or so I've been told), I have included profiles of a few of the solar-powered homes I've come across while interviewing people for my columns in *Log Homes Illustrated* and *Countryside* magazines.

And finally, for those of you wondering if I changed the fable at the front of book to reflect the growing popularity of grid-tied systems, the answer is: Nope; couldn't bring myself to do it. I'm an off-grid guy at heart and so the fable remains, untouched and untouchable. Besides, the critters wouldn't let me change it even if I wanted to.

— Rex A. Ewing, 2006