



Renewable Energy Terms

Free—No Cost?

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Derivation: From Middle English free, and Gothic frijon, to love, applied to members of a family or clan, as opposed to slaves.

How “free” is renewable energy? I often find that people have unrealistic expectations about renewable energy systems. There’s something about the “free” nature of solar, wind, and water power that leads people to expect it to be universally applicable, maintenance free, trouble free, and cheap.

What if we approached buying and owning a house with this attitude, and expected it to be cheap, maintenance free, and high quality? It’s true that RE systems don’t have fuel costs, but the energy-capturing equipment is far from free. In fact, it can look pretty expensive compared to government subsidized grid energy. And in our culture of buy now and pay later, paying for your energy 30 to 50 years in advance in the form of PV panels needs to be put in perspective.

When we buy a house, one of our first decisions is location. Do we disregard our need to live near our work, our favorite stores, or our preferred educational opportunities? If so, we might end up with a house that just won’t work well for our lives. Similarly, if we try to put solar-electric panels in the shade, wind turbines near the ground, or hydro turbines where there isn’t enough water, we’ll be disappointed.

We also need to decide what type of house is appropriate for our needs. It doesn’t make any sense to build an igloo in the jungle, or a palm-frond house in the Arctic. When it comes to renewable energy systems, we need to match the system to the resource. No matter how much we might like the idea of using wind energy, we’ll get nowhere with it unless our site has enough wind. A complete site survey will look at all resources available, and focus on tapping the most appropriate mix.

A single person doesn’t need a three-story townhouse, and a large family probably will not be comfortable in a studio apartment. In the same way, renewable energy systems should be sized to fit the users. Too often, people new to the field want to know what a system for an “average house” will cost. But the size of an RE system is tied not to the size of the house, but to the energy appetite of the occupants. This is why a thorough load analysis is step number one for designing a successful system.

Once we buy a house, we don’t expect it to be maintenance free. We have to clean it regularly, heat or cool it, and deal with other maintenance tasks. A renewable energy system is the same. Even PV modules, the most reliable component in these systems, require cleaning, and will suffer if abused. Wind generators, hydro turbines, and other mechanical equipment need periodic care. Batteries demand regular care, and will die prematurely if treated poorly.

Do all the parts of our house last forever? We expect to replace the roof, floor coverings, and furnishings at different intervals. Renewable energy systems are similar. Batteries are the most significant replacement item. Depending on the quality of the batteries and the care we give them, they’ll need to be replaced every 2 to 15 years. If we expect the system to give us “free” energy, the price of battery replacement will be a shocker. Other components may need rebuilding or replacement at times too, though most system components are very long lasting.

So how free is renewable energy? Once you make the initial investment, and plan for the maintenance and replacement costs, it looks pretty good. But you still need to deal with the weakest link in any renewable energy system—the humans.

Poor system specification or design can sink a system from the start. And unrealistic expectations can make the system unsatisfactory too. Every system is designed for a specific usage, and if you expect it to do more than it’s designed for, you’ll be disappointed. Renewable energy producing sources give us a certain amount of energy to work with, and we have to live within that budget. Treating a battery as if it’s an inexhaustible resource will leave you with a damaged battery that needs replacing.

Someone once said, “Freedom isn’t free,” implying that we have to work for it. The same is true of the “free” energy we harvest from the sun, wind, and water. Be realistic about what it takes to farm it, and you’ll be pleased with the bountiful crop.

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