

First Things First

Making the decision to install a renewable energy system is a big step towards having more personal control in meeting your energy needs. To ensure that the system you have installed will meet those needs in the most cost-effective way, there are two key, preliminary steps you need to take. First of all, you have to know how much electricity you use, which is called your electric load. Second, you should incorporate as much efficiency into your electric use as possible.



by Stjepan Vlahovich

How Big Is Your Load? Check It and See

Your electric load is the total of all of the electricity you use. Everything in your home that uses electricity through a plug is a part of that load. If you're adding renewable energy to your existing home, it can be fairly simple to figure out your total annual use. You can find that information on your electric bill or by requesting it from your electric company. If you're incorporating a renewable system into a new home, you can still use your current electric consumption as a starting point. You will also need to consider what changes in electric use, such as additional appliances, you anticipate having in your new home.

Your annual electric use is a critical piece of information. However, to make the best plan for your renewable energy system, you need to know much more about what makes up your electric load and how it fluctuates over the course of the year. There are several approaches you can use to determine the components of your electric load. Since almost all of us have many of the same things that use electricity — refrigerators and clothes washers, for example — you could make assumptions, based on national averages, about your load's components. But even if we have the same things, we often use them in different ways and in varying amounts. You're installing the renewable system on **your** home, not the average home. Therefore, you should take the time to figure out as precisely as you can how you and your family use electricity.

What Time Is It? Watt Checking Time

The best way to do that is to make an itemized list of everything that uses electricity in your home. As you make that list, you should determine how much electricity in watts each item uses. This information can usually be found on a sticker or plate attached to the item. For an even more accurate number, though, consider using a watt meter. The watt meter will tell you how much the item actually uses, rather than what it was designed to use. Along with the information about watt usage, you need to record the amount of time each day the item is used. These two pieces of information will allow you to calculate the watts per day you need to operate that item. It's the total of all of these watts per day that will tell you how much energy your renewable system will need to produce to meet your electric load.



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Vampires Infesting Your Load?

Some of your electric users – refrigerators, lights, clothes washers and dryers – will be easy to figure out. Those year-round users are important, but don't forget to include occasional and seasonal users of electricity such as power tools, holiday lights, room and central air conditioners, humidifiers and dehumidifiers, pool pumps, etc.

Other electric users may surprise you, especially those often dubbed phantom energy users or energy vampires. These are the things we have, often in abundance, that are using energy even when we think they are turned off. Televisions, microwaves, computer printers and modems all use a small amount of power all of the time. This power makes it possible for them to work instantaneously when we do turn them on.

In addition to the phantom power users, many of us have things that are always on, such as answering machines and security systems. You may not realize that other things, such as VCRs, and DVD players, are drawing power all the time, too. But they are. In fact, all of your plugged in appliances that have timers and/or digital clocks are constantly using power to operate those features. And then there are all of the battery chargers – for your cordless phone, digital camera, and cell phone – adding to your load. Individually they don't use much, but together they can add a surprising amount.

Figuring this all out really isn't as daunting as it sounds. The calculations you need are very simple to perform. You can even turn the process into a fun bit of sleuthing. Guess how much individual items use, and then see if you're surprised by which consume a lot of power and which consume a little.

Need Help? It's a Click Away

An article by Scott Russell in the August & September 2004 issue of *Home Power* magazine is an excellent guide to what may seem to be an overwhelming process. There you will find a detailed explanation of how to find and calculate the information you need to determine your energy load. *Home Power's* website also includes a link to a Microsoft Excel[®] spread sheet you can use as a guide. www.homepower.com/files/loadcalc.pdf.

Overweight Load? Put It on a Diet

The *Home Power* article also stresses the importance of the second key, preliminary step in preparing for your renewable energy system: energy efficiency. Even if your goal isn't to have your system power everything, it makes no sense for you to generate more electricity than you really need. Since renewable energy is still almost always more costly to produce than non-renewable energy, it's smart to



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become as efficient as possible in your use of energy before deciding what size and type of system to install.

The general rule is that every dollar of investment in energy efficiency will save you three dollars of investment in your renewable system. John Robbins, a pioneer in the use of renewable energy in the Cincinnati area, found this out when he decided to power his home office with solar energy. His first step was to invest \$1,500 in energy efficiency improvements. This reduced his office's electric load by 85 percent. That reduction allowed him to shave \$5,000 off of the cost of the solar electric system he installed.

As you do the calculations on your home's energy use, you will undoubtedly find efficiency improvement opportunities. Some of the more common ones are replacing older appliances with more efficient, ENERGY STAR[®] qualified ones, replacing incandescent light bulbs with ENERGY STAR[®] qualified fluorescent ones, and lowering the temperature on an electric water heater and/or making certain it is well and properly insulated.

There are even ways you can reduce the power needs of your phantom energy users. For example, many battery chargers draw power even after the battery is fully juiced. Don't leave those chargers plugged in after they've done their work. In fact, for many of the phantom users, the simplest solution is to unplug them when they aren't doing anything useful for you. If it's too cumbersome to be crawling around pulling individual plugs, use switched power strips to turn off those phantoms and interrupt their drain on your power. Whatever strategies you use, like John Robbins, you should take advantage of your efficiency opportunities.

Once you've calculated your electric load and made your electric use as efficient as possible, you'll be ready to work with your certified installer to determine the size and type of renewable system that will meet your goals and needs most reliably and at the lowest cost. All of the information you have gathered will make that an easier task.

A Place to Start for Equipment and Installation

A list of North American Board of Certified Electric Practitioners (NABCEP) installers and renewable energy equipment manufacturers is maintained by Green Energy Ohio. <http://www.greenenergyohio.org/page.cfm?pageId=314>

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