

What to Expect From Your Dealer

Every renewable energy (RE) system begins its working life as a pile of equipment. Preparation, planning, and proper installation, are all essential if the system is to be a success. You can do it yourself or you can get help from an installing dealer. Here is what to expect from your dealer. And here is what you may miss if you decide to do it yourself.

Load Analysis

Every RE system should begin with a complete, accurate and thorough analysis of the appliances to be used in the system. If the load analysis is not properly done, the system is bound to disappoint its users. If the system's energy consumption is estimated too low, power shortages and dead batteries will soon follow. If the estimate is too high, the user will be wasting money on unneeded equipment.

So, who does this load analysis - the system's user or the person who sells the RE equipment? In most cases, both contribute information. The user lists and gathers data about each appliance (don't leave out even the smallest one, and don't forget to plan for future appliances.) How much and what type of electrical energy does the appliance consume? How long will the appliance run? The dealer then takes this information and generates an estimate of daily energy consumption. A good dealer will also recommend appliance changes to reduce the systems energy use.

The golden rule is: Every Dollar spent on an efficient appliance saves three to five dollars in system components. A good dealer knows this and will suggest replacing inefficient appliances (such as incandescent lighting and self-defrosting refrigerators that spit ice cubes out the door), with the most efficient types available. Listen to your dealer. He's not trying to sell you an expensive refrigerator. He's trying to save you three to five times the cost of that fridge in solar-electric modules, controls, batteries, wiring and inverters.

Sad to say, many systems are purchased without ever doing a load analysis. Anyone who does this is wasting money, and is apt to be disappointed with the system. A good RE system dealer will insist that a load analysis be done before selling you a system. If you haven't done this analysis, your dealer will nag you into it, or visit you and do the analysis with you. The dealer deserves to be paid for this generously because he or she is really doing *your* homework.

A Budget is Not a Load Analysis

Don't buy a packaged system just because it's within your preferred budget. Do the load analysis, and if the system needed to power these loads is too expensive, modify the loads. Replace inefficient appliances, and, if need be, eliminate appliances until the system is affordable.

It is not unusual to go through the load analysis and system design phase three or four times before the right setup is found. A properly designed system costs what the user can afford to spend on the system, and the load analysis details the energy consumption of each appliance.

Site Survey

A site survey is an analysis of a specific location for its renewable energy potential. Every place is different, but your system is going to be installed in a specific location. You need to determine what types and amounts of energy (solar, wind, water) are available to you.

A Solar array needs to be located where it will receive the maximum amount of sunlight. With seasonal variations in the sun's declination, and possible shading from hills, trees and buildings, finding the best spot for the solar array can be difficult, but an experienced dealer is well able to do this for you.

Wind is a difficult resource to survey. Local experience is sometimes required, or the installation of a small generator at the proposed site, which is then monitored over a period of a year, can indicate whether the site is suited for a larger generator. Checking for vegetation 'flagging' and of locally

recorded wind data may also be required to establish suitability of the site.

Hydro is the easiest renewable energy source to survey. All that is required are accurate head and flow measurements and some historical data on the seasonal output of the water source.

Many dealers combine the load analysis and site survey into one trip to minimise costs.

System Design

Designing a renewable energy system means using the system's energy requirements and the site's RE potential to power a specific list of equipment. This RE equipment supplies the needed electricity within the limitations of the load analysis and site survey. Put into words it sounds easy, but really there is just as much art as science involved in system design.

Good system designers have learned through experience what works and what doesn't. They know which equipment works well with other equipment. They know details such as what kind and size of cable/wires are required, inverter/appliance compatibility, whether seasonal solar tracking should be used, what sized pipe to use on a hydro, how tall a wind tower should be, and how the batteries should be configured. They know your local RE environment. When you pay someone to design your system, you are buying their expertise. In almost all cases, professional help with system design pays off. Mistakes in the design phase are expensive to fix after installation.

Every system, regardless of size and without exception, should be safely designed. Overcurrent protection devices, disconnects, and proper conductor use make for a safe system.

Your dealer should have a current Practicing License, or he must use the services of an electrician with this qualification. This precludes anybody not holding a current Practicing License from opening up equipment for the purposes of bench testing or examination requiring internal inspection. Renewable energy is real. It can burn down your home or kill you as easily as the grid.

Once the system designer has a specific list of RE equipment, they calculate the system's hardware cost. At this stage, the customer usually chokes and says, "I can't afford that!"

Does the system's designer begin deleting solar modules and batteries to bring down the cost of the system? **No!** A good system designer goes back to the load analysis to see if they can do anything more efficiently. Can we do without some of the luxury appliances?

The system's designer and user work on the load estimate until the system becomes affordable.

A good designer will revise the design until it satisfies the load estimate and the customer can afford all the hardware. This is an essential give and take process. One very important result of this process is that the user is made aware of the system's capabilities. If the designer knows what he or she is doing, the customer will know what the system will power before it is installed and operational.

System Purchase

You have now arrived at the moment of the big decision, where you get to part with your hard earned cash.

Now is a good time to pause. Are you comfortable with your Dealer or do you feel as though you require a second opinion. If you decide on a second opinion, now is the time to pay the first system designer for the help in load analysis, site survey and the work in designing your system. This makes the design yours - you just brought it. If you decide to buy from another dealer, this essential information is still yours to use.

Charges vary for this service, and many designers will refund this charge if you buy the gear from them and have them install it.

It is common for installing dealers to ask you to pay for some or all of the hardware prior to installation. This allows them to use your capital to finance the job. It is not uncommon for installing dealers not to have all the equipment for your system in stock. Inventory costs money. You should never have to pay for installation labour costs until the system is installed and working to your satisfaction.

It is not uncommon for installing dealers to refuse to install hardware they did not sell. Installing dealers are working on very slim margins, as they are beset on all sides by competition from companies that offer low prices instead of quality, onsite service.

At this point, money changes hands. Everything must be on paper, one copy for the installing dealer and the other for the system customer. In this packet of paperwork you should have:

- A copy of the final load analysis
- A copy of the site survey
- A printout of the system design
- A schematic of the system
- All estimated RE production data
- Manufacturers' spec sheets for all components
- A copy of the hardware bill.

Your installing dealer will now take your cheque, order your gear, and prepare to return to your site for installation. This entire process may take two to six weeks, so be patient.

Installation

If your system is being installed by an installing dealer, you should consider becoming his shadow. This person has done dozens of these systems. The installing dealer has a wealth of information and will explain every wire and every device, if you have sense enough to ask.

The installing dealer should show you how to do battery watering and any other routinely required maintenance. The dealer should also explain how to operate the system's controls, how to use the inverter, and how to understand the information displayed by the system's instruments.

Most installing dealers will let you work with them. Most dealers would rather have you dig the wiring trenches and wind machine tower foundation holes. You can also save money by building the power shed to house the solar modules, batteries and inverter. Installing dealers are highly skilled and mostly very busy. You can pay them to dig your trenches or you can do it yourself.

As mentioned before, most installing dealers will not install hardware that they did not sell. Please don't shop around for a cheap deal on RE equipment and then ask your local dealer to install the system. If you want installation, pick a dealer and involve him from the very beginning. Installing dealers must both sell the hardware and install it if they are going to make a living. Respect this, and your local dealer will be a terrific resource.

Passing Electrical Inspection

Many installing dealers also possess a current Practising License. Those who do not, hire an electrical contractor to oversee their work and show up for the electrical inspection.

Dealer Support

Your installing dealer should support you. If any component fails while under warranty, the dealer should remove it from your system and seek a warranty repair on your behalf. When the component is repaired or replaced, the dealer should reinstall it at no charge to you. You should be able to call your dealer and ask questions about your system's operation. If you are not getting this type of service from your dealer, change dealers.

If you designed and installed your own system, you have little recourse for service. If things go wrong or don't work when installed, calling the business who sold you the hardware may not do you much good.

Please realize that your installing dealer has overheads and expenses. Expect your dealer to charge you mileage, and understand they must do this in order to stay in business. If this personalized service is worth the approximately 15 percent extra that the system's hardware will cost when designed by, purchased from, and installed by professionals, then your dealer is your man. If not - then you're on your own should problems arise.