



BACKWOODS SOLAR FALL 2007 NEWSLETTER



(Scott and Tracey's Hydro Powered Homestead)

IN THIS ISSUE:

- SOLAR MODULE AVAILABILITY
- CAFRAMO ECOFAN 802 AIRPLUS: ON SALE
 - ALL ABOUT BATTERIES REMINDER
- TROJAN and SURRETTE BATTERY PRICE HIKES
 - E LIGHT 3 and 6 LED FIXTURE RECALL
- RENEWABLE ENERGY HELPERS NATIONWIDE NEEDED
 - YOUR STORY for our NEWSLETTER WANTED
 - COMING TO SOLAR: by TOM PRISCIANTELLI

SOLAR MODULE AVAILABILITY



On August 28th, **Kyocera Solar** announced that they had unexpectedly won a bid for a project in Brazil. This project requires Kyocera to allocate every single KC130 module they will produce through the end of 2007 to that project. *BRILLANT....not!!* At this time, we're unable to place orders for the Kyocera 130.

In order to fill this void, we have added the **Mitsubishi MF125UE** module to our product line. It is UL Listed with a 25 year warranty. Made of Polycrystalline Silicon, it offers high efficiency; high reliability; and high safety. MC4 multi contact cabling is required with these modules.

Mitsubishi has applied leading-edge technology from its space-related applications to terrestrial systems to create high performance photovoltaic power-generation systems for an astonishing range of installations. Mitsubishi has successfully produced the first cells that do not require solder coatings. This accomplishment is a milestone in the development of environmentally friendly composite materials.

Click here to view the [Limited Warranty](#).

Model	Amps	Volts	Size	Price
MF125UE-125 watts	7.23	17.3	58.9" x 26.5" 29.8 lbs	\$690.00

FREE SHIPPING to a lower 48 address: a \$50.00 per module value!

The **Unisolar US64** watt amorphous module is in stock at Backwoods for immediate shipping and we do not foresee a shortage in the near future. The US64 warranty has not changed.

SolarWorld modules are also in stock at our distributors. The SW165 and SW175 continue to ship truck freight so we do need to get a freight quote when these modules are ordered.

Evergreen Solar has discontinued their Cedar line of modules and we have sold out of their modules.

Photo courtesy of Jay Beedle in SE Alaska. Please visit Jay's website www.harvandmarvs.com to find out more about Jay's off-grid living tours!



CAFRAMO ECOFAN™ 802 AIRPLUS
On Sale through December 31, 2007

The Caframo Ecofan™ is a heat powered fan designed to circulate the warm air created by a wood stove. These fans do not use any batteries or wall cords. They have a thermoelectric module which acts as a small generator to power the fan's motor. When this generator module experiences a heat differential between it's top and bottom surfaces, it pumps out electricity. The bottom surface of the module is heated by the base of the fan, while the top of the module is kept cooler by the fan's top cooling fins. The Ecofan Airplus is designed to be used on freestanding woodstoves with normal surface temperatures of 400-650 degrees F for optimum performance. Temperatures above 650 degrees F(340 degrees C) will damage the Ecofan. We highly recommend that the Ecofan be used in conjunction with a wood stove thermometer to avoid overheating the Ecofan.

• One year warranty • Made in Canada

Ecofan™ 802 Airplus: Regularly: \$126.00 SALE PRICE: \$116.00 (\$12.00 shipping)
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A Note from Scott and Tracey

Caframo's Ecofan has been in production for many, many years. We used an early two bladed model for several years before it finally ceased to operate (probably because we overheated it on a regular basis!) We loved its aesthetics, and its blade rotation visually indicated the amount of wood in our stove. As the wood decreased, the blades slowed and we knew it was time to restoke the fire. We hesitate to say that the twin blade action moved appreciable amounts of air but we enjoyed having it. Tracey and I

have once again test driven the new three bladed model and it has performed flawlessly. And we are happy to report that it does move significant amounts of air (actual CFMs are hard to quantify).



ALL ABOUT BATTERIES *REMINDER*

In our Summer 2007 Newsletter, we published an extensive article on properly caring for your Trojan and Surrette deep cycle, flooded lead acid batteries. We'd like to take this moment to remind you. If you've read it, we encourage you to re-read it. If you haven't read it, PLEASE do. Here's a link to the Summer 2007 Newsletter:
<http://www.backwoodssolar.com/newsletter/pdf/SUMMER%202007%20NEWSLETTER.pdf>

TROJAN and SURRETTE BATTERY PRICE HIKES



Unfortunately we have had to adjust our Trojan and Surrette battery prices yet again. Since September 10, 2007 the price of lead has risen more than 21% from \$1.32 per pound to over \$1.60 per pound. We have not had a recent price hike from Concorde but if the price of lead continues to climb, it too will follow.

As of September 27th, 2007 our battery prices are:

TROJAN: T-105: \$136.00; L-16H: \$336.00

CONCORDE: 2580L: \$694.00; 2120L: \$486.00; 2240: \$254.00

SURRETTE: 2-KS-33PS: \$707.00; 4-KS-21PS: \$919.00;

4-KS-25PS: \$1125.00; 6-CS-21PS: \$885.00 8-CS-25PS: \$1363.00

These prices are subject to change without notice



E LIGHT PRODUCT SAFETY RECALL ANNOUNCEMENT

From the manufacturer:

Dear E Light owner,

ALL MODELS OF THE E LIGHT LED LIGHTING FIXTURE ARE BEING RECALLED BY THE MANUFACTURER.



A possible electrical component failure may cause risk of fire. Remove E Light(s) from service immediately and disconnect from source of electrical power. Return E Light to manufacturer for a full refund. For instructions call the toll free 1-866-522-1368 or visit the website at www.E-Light-Recall.com The manufacturer will send a product return kit.

RENEWABLE ENERGY "HELPERS" NATIONWIDE NEEDED



Historically, Backwoods Solar has maintained a list of Solar Helpers. This list represents installation services offered by licensed electricians, certified solar experts, etc.

However we have found that the vast majority of our customers want to install their own systems and would actually like to visit or speak with or write a "neighbor" that has a renewable energy system in place, prior to their installation.

To facilitate this interaction, Backwoods Solar would like to compile a list of people nationwide that have renewable energy systems if they're willing to let interested individuals contact them. We would maintain a list of Renewable Energy Helpers on our website and only

release the information approved by the Renewable Energy Helper. This information may include a physical address, a phone/fax number, an email address or any combination of these details. We respect the privacy of anyone willing to share their renewable energy system with others and we want it to happen on their terms.

You may find that your county inspector requires a licensed electrician to sign off on your installation and you may want that electrician's assistance in general. We know that the experience gained by "doing-it-yourself" is invaluable. You will remove the mystery of running your own power station and you will develop an intimate understanding of each component. This familiarity simply doesn't happen if you do not participate in the installation process.

So if you share our opinion and would be willing to open your home to those folks that are new to this renewable energy arena, please let us know.

The photo shows Terry Graybeal (Backwoods Solar employee) and his wife Martha at their hydro intake.

YOUR STORY for our NEWSLETTER WANTED

Backwoods Solar would like to share your "off-grid" story in our newsletter and we would offer a \$150.00 credit on your Backwoods Solar account in exchange for a story that gets published. We would look for a discussion of your renewable energy system and its integration into your way of life. It can be more or less technical and should include photos. Email submissions are preferred but we will happily entertain all forms of entry. If you have any questions, feel free to email us info@backwoodssolar.com or give us a call 208-263-4290 or mail us: 1589 Rapid Lightning Creek Rd; Sandpoint, ID 83864.

COMING TO SOLAR
By Tom Prisciantelli



Coming to Solar

My wife and I considered alternative energy back in the 1990s. We had lived in New York and moved to Arizona. The move to Phoenix gave us a greater appreciation for the sun. We subsequently moved to a remote location in northern New Mexico, near the end of a dirt road with no utilities. Part of the idea was to "get back to nature" and hopefully live a simpler life, less cluttered with the daily concerns of surviving the rush hour.

We did get back to nature but it was far from a simpler life. It became more complicated than we had expected and for someone who is not a "Do-It-Yourself" kind of person, I was at a loss and we almost bagged the whole idea.

Design and Planning

We used a solar architect, Mark Chalom from Santa Fe, to design a passive and active solar adobe house (1600 square feet). It is considered passive because it takes in the sun's heat through south facing windows in the winter and with the thermal mass of floors and walls absorbing the heat, the stored heat is later released into the house at night, thereby keeping the house

warm. We have a propane stove and wall heater which we can use during days when it is cloudy and very cold but we will often go weeks without requiring this form of heat -- temps can get down near zero at times. In the summer, because of the design and insulation of adobe, we close the windows during the day and open them up at night releasing any hot air in the house and bringing in the cooler night air. Although we reach close to 100 degrees on some days in the summer, we do not need an air conditioner. Also, our home is considered an active solar home because we have a solar hot water heater. Throw in a solar array and batteries to provide electricity and you have a solar powered house.

Our solar power system was designed and installed by Allan Sindelar and his team at Positive Energy in Santa Fe. We went through a rigorous process of defining how much power we would need daily to survive off the grid. We defined all the appliances we needed and the watts they consumed -- the number of watt-hours per day. Based on our calculations we required 1500 watts of solar array (ten BP SX150 modules), an Outback FX2548 Inverter, Outback MX60 Charge Controller, 16 Surrrette S-460 6V 350 Amp hour batteries and other components such as lightning arrestors, poles, conduit, wiring, etc. The hardware total came to around \$21,000+. Prior to this process we had installed a well house with it's own array of 480 watts to drive the well and booster pumps, and a 1,000 gallon water tank (cistern). Our well is 600 feet deep, with the well pump at 400 feet and the static water level at 135 feet. We use about 20 gallons of water a day.

General figures including hardware and labor:

Well (parts and labor) - \$30,000

Solar Installation (parts and labor) - \$27,000 (includes some work in the well house)

Architect - \$18,000

House construction - \$306,000

Although the cost seemed high at the time, the final product was exactly what we wanted and needed for two people to be comfortable. It was what happened once we settled in that made us wonder about the responsibilities of maintaining a solar powered home.

Lifestyle Changes (good and bad)

Our property is about 50 miles north of Santa Fe, New Mexico. We have 20 acres backed up against Carson National Forest, our backyard. The mountain behind us, Sierra Negra, has energy that is difficult to describe. You can feel it during hikes or just sitting out in back. From our house to the mountain are scattered remains of Indian petroglyphs -- symbols scratched in rocks of a person on horseback, birds, coyotes, snakes, animal footprints that in one area walk up toward the mountain's summit. There are also some religious figures, which I doubt were created by the early Indian inhabitants - we have found crosses scratched in rock that seem to mark a trail to the top. And local legend has it that the Conquistadores buried treasure in a cave near the top. We found a large cave dug into the wall of a Basalt (former lava flow) cliff. We have no reason to go into the cave but have found all kinds of animal scat at the entrance. Broken pottery and arrowheads are scattered all over the ground from our back yard to the top and we have even found some Chert (a quartz-like rock) tools that were transported here from Cerro Pedernal, a mountain west of our location that has artifacts such as these dated to the early PaleoIndians, about 12000 years old. We went from the rat race to a major awakening but what one knows to survive in the city won't do much good in the country.

Living Remotely

In a remote location you're on your own. If there are problems, it is difficult to find help. In northern New Mexico just getting a contractor to show up or even return a phone call is a major accomplishment. Then, mention solar arrays and battery banks, you get an even less enthusiastic response. Many don't like dealing with DC current which the well pump requires. For help with specific solar issues (inverters, charge controllers, batteries, arrays) it costs a bit for a solar electrician to drive up here from Santa Fe but at least they show up. The bottom line is that you have to become your own plumber and electrician - something I never wanted to become - a "Do-It-Yourself" person. I admire those who are but I'm not and never hoped to be one. Moving to the country was supposed to make life simpler, less complicated. It's just the opposite but in most cases worth it!

Recommendations

If you are a "Do-It-Yourself" person, congratulations! If not, here are some thoughts from a true amateur:

- 1) Be careful about how much technology you introduce into your solar house. Each new piece requires knowledge of its internals or you'll be spending a lot of time tracking down contractors and spending more money than you had planned. For instance, we decided that a solar hot water system would be ideal for saving money on propane to heat our water. That's an example of technology you may not need and if there is a problem, you'll need a plumber and electrician (mainly solar electrician) to fix it. A propane heater may be less expensive long term.
- 2) One of our biggest investments was in the well house and that investment continues to grow. If water is scarce, you'll probably have to dig a deep well. There are well pumps that can pump at great depth (600+ feet). With a deep well, the well pump is usually dedicated to filling a water tank or cistern (1,000 gallons or more). A booster pump sends water from the cistern to a water tank in the house to pressurize your water line. What can happen with a well pump? One possibility is the controller that runs the pump may start stalling for lack of sufficient power or malfunction. Or the booster pump might have to deal with air that occasionally enters the pipes from the well to the cistern. This will cause the booster pump to cavitate -- attempting to pump water with air pockets. A well known pump manufacturer has a booster pump that handles all kinds of faults but for some reason can't handle cavitation. It stalls and has to be manually restarted. There's a similar problem with a well pump controller. This requires trips down into the well house and time to diagnose the problem and hopefully fix it. If you have a well problem, hopefully your installer will return to fix it. Otherwise you may have difficulties finding someone who wants to deal with DC and solar.
- 3) Oh yes, dig a well first before building the house. You may find there is no underground water supply. A neighbor dug over 1,000 feet and just hit mud. We used a witcher. It actually paid off and what a show he put on! You could capture water off the roof, as we do, but we share it with the animals and plants. We don't use it for drinking but we have showered in it - the softest water I've ever experienced. We know of three separate remote homeowners who claim they live off

- roof water but each one has a friend they visit often for the convenience of clean, running water for washing clothes or the occasional casual shower - longer than a minute's worth.
- 4) Often times it helps to share information with contractors -- such as things we've learned that they may benefit from. Or problems with products they sell that don't work well in a solar environment and a way around the problem. It's a good way to get contractors involved in your success and helping to solve your problems.
 - 5) Document everything you do. Keep a calendar of events - weather, problems with plants and trees, when to equalize the batteries and what happened during the last equalization process. And, whenever you fix a problem, write down what you did and if the problem pertains to a particular time of year, note that on the calendar so you're prepared next year. In the southwest, we keep track of the summer monsoon rains. We live by their arrival and departure.
 - 6) Finally, if you're a handy-man type or do-it-yourselfer, you'll love living on solar power and/or wind power. You will gain a sense of the energy and rhythm of the house and its mutual relationship to what surrounds it (land, air, sun, etc.). It's an amazing feeling to have this intimate connection to your home. You will know if you are a do-it-yourselfer if, when some problem occurs, your response is: "that's interesting". If you're not a do-it-yourselfer, your response is: "Oh No!".
 - 7) Buy some books. "Photovoltaics Design and Installation Manual" is available through Backwoods Solar. "Wiring 1-2-3" and "Plumbing 1-2-3" can be found at Home Depot. And a basics course on electricity is a must, particularly for troubleshooting a problem. "Electronics for Dummies" is basic and "Teach Yourself Electricity and Electronics" is more involved. A multimeter helps for troubleshooting voltage and other problems - the Fluke 110 True RMS does fine for me. If you are going to test electrical current, that's more involved and a bit dangerous particularly with the jolt you can get from DC current. Over time you'll run into problems or things you want done but don't have the background needed. Keep a list of those problems and pay an electrician, hopefully a solar electrician, to spend part of a day with you on those issues. It's worth the cost. Treat him or her as though he or she is the Zen Master of Solar Power. Have fun!

Impressions of Living Remotely and the Payoff

I get tired of hearing the talking heads (politicians and the Hollywood crowd). Everyone is going green. A well-known politician buys energy credits to justify the electricity he uses for his two huge homes. It's his get out of guilt card and proves he's green. Energy credits have proven to be counterproductive and justify nothing other than more ways for power companies to skate on their responsibilities to the environment and energy generation. I would say to him, you don't need two huge homes for just two people. One of my favorite female musicians says she only uses one piece of toilet paper when she goes. I'd say, just flush less often and go outside when the weather is nice. A Hollywood queen says she's only going to take three-minute showers. I've never taken a shower in my life for more than 2 minutes. My wife and I use 20 gallons of water a day and remain clean. And living remotely with limited water, a one-minute shower is more than enough to stay clean and healthy. Or use the water you capture off the roof.

As I've said, I'm tired of the talking heads talking the talk. And many of them believe that the government is the solution. This process cost us a significant amount of money but we found out what living really means. We're not frontier people but I can tell you I have the greatest respect now for those who moved west to populate this country. All in all it was worth the effort and cost for this adventure. We respect what we have learned and have. It's an individual thing. The government will never get it right. Some talk the talk, others walk the walk. And we couldn't have done it without the great people who walk the walk at Backwoods Solar and Positive Energy!