

FALL 2005 ONLINE NEWSLETTER

**Photovoltaic Industry Update and Backwoods
Solar Module Availability and Current Pricing**

**All About Batteries:
Maintenance, Water Miser Battery Caps, and
the Battery Life Saver De-Sulfator**

**Business Briefs and Product Sales:
Sunfrost Price Hike
New Home Energy Diet Book
10% off Cozy Direct Vent Wall Heaters
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**Be sure to check out the additional PDF files
from Solar Outlook, Trojan Battery, and Tom
Kingsland's De-Sulfator test results**

A Photovoltaic Industry Update and the Current offering of modules from Backwoods with new pricing, and availability

Unfortunately the lack of solar module supply continues and maybe even worse than we have reported in previous newsletters. Paula Mints, Associate Director of Navigant Consulting, has issued a Quarterly Photovoltaic Industry Update for September 2005 which gives us an insider's look at the current situation. She has graciously permitted us to share this information with you. I have selected a few immediately pertinent paragraphs from her report to publish here and the entire Solar Outlook PDF can be opened from the Backwoods Newsletter web page.

The following excerpts are from "Solar Outlook" by Paula Mints.

"With 2004's 54% increase in shipments along with strong demand for PV products, the industry had every reason to celebrate...that is if you ignore the ongoing silicon feedstock shortage, the high cost of raw material, and ever increasing module prices to the first point of sale in the market. If you look beyond the current roadblocks to growth, let the celebrations begin.

In Barcelona this past June, despite surface optimism, dire predictions of slowing growth were heard on the exhibition floor from cell and module manufacturers and members of the selling channel alike. Even without the silicon feedstock shortage, demand of the magnitude in Germany would impact other markets – but a raw material shortage did indeed add an interesting layer to the discussions.

Without belaboring the point, the industry has been warned about the consequences of not taking drastic action to solve its raw material problems. Over the years alarm bells have been sounded, consortiums formed, and discussions held both quietly and with much fanfare – all purporting to solve the industry's raw material concerns before these concerns blossomed into crisis. These were important discussions, considering the fact that 95% of industry sales are made up of mono and poly crystalline products. And if you'll pardon the pun, though sand can be found in abundance, turning this sand into solar grade silicon is not exactly a walk on the beach.

The industry did not intend to get caught in the current situation – one of enviable demand along with an unenviable supply problem – however, making the expensive decision to expand its raw material capacity is not easily taken. Demand for PV products is subsidy driven – still a push not a pull. There is a high upfront cost to buying a photovoltaic system and this capital outlay continues to make "going solar" a difficult choice for grid-connected consumers. Germany's feed-in tariff law, which allowed system buyers to sell electricity at a profit, is the primary driver propelling strong demand for PV systems in that country, but without this law demand would subside sharply.

In the United States strong demand in New Jersey and California are driven by rebate programs, and Japan's successful PV industry was spawned by subsidies. In other words, demand for grid-connected PV products worldwide is artificial. Buyers do not desire or shop for a PV system in the same manner that they shop for a new home or a new car. And, though interest in PV has certainly been piqued in the industrialized grid-connected world, this has not translated into strong demand or sales in areas where subsidies do not exist.

Even the PV industry, in sober reflection, did not believe that demand of over 30% a year (averaged over 30 years) would continue – so, how can PV expect its raw material suppliers to have faith? Over the years silicon feedstock manufacturers serving the semiconductor industry were burned – time and time again – by taking the expensive decision to increase capacity only to end up in the midst of a semiconductor slowdown and thus compelled to sell product at unprofitable prices. Again, given the expensive nature of the decision to increase capacity, why would it be taken on the expectation that demand in the PV industry – which is artificial for grid-connected systems – would continue unabated.

Yet, the PV industry is now experiencing the consequences of not increasing raw material capacity. Its raw material is now scarce. If the semi-conductor industry has a good year, there will be further supply strains. The PV industry now finds itself paying extremely high prices for its raw material, and indulging in long term contracts similar to those that broke the state of California during its energy crisis, and it cannot escape a bit of culpability for the current situation. Because, though the industry may not have believed wholeheartedly in its own success, it was certainly hoped for – so why not bite the expensive bullet and plan for it?

As we continue to promise the world lower module and system prices the rationale behind the promised downward trend remains disconnected from market realities. The promise of extremely low system prices ignores profit taking all along the value (supply) chain because it assumes a direct and unassailable connection between module cost and system price, along the way forgetting the needed mark up to the first point of sale and beyond, along with the cost/price of balance of systems, labor, permitting, warranties and the simple expense of dealing with customers. Governments naturally expect the PV industry to deliver a rate of decline in system prices that resembles what the industry promised. In Germany, system prices are 40% to 55% higher than they were two years ago. This is not proof of the inevitability of lower system costs – it is however, a confirmation of market forces.”

Paula's article continues with a preview of 2005 manufacturer shipments; average module selling prices on the rise; solar airports; news in brief from around the industry; and more.

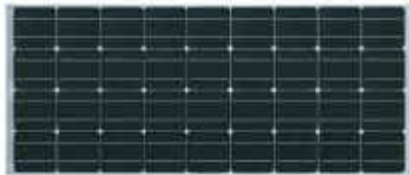
As Paula points out, grid-connected PV demand is artificial whereas the demand for off-grid PV applications is, in our opinion, economically practical in many situations. And in today's uncertain times, the sense of security and self-reliance garnered by producing

one's own energy is comforting and sensible. At Backwoods Solar, we strive to make this experience as enjoyable and cost effective as we can. Unfortunately, we too have experienced many repeated price increases on our solar modules as well as supply constraints which have pushed patience to unanticipated limits. We want to thank everyone that has accepted the realities of PV module shipments. If we could, we would ship sooner rather than latter, but we have lost all control of module supplies. We are absolutely at the whim of manufacturers who let us know when they will even accept orders from us. Lead times can easily exceed 8 weeks at this time and industry "experts" suggest that this situation may continue until 2008.

Below, find an update on the solar panels which we currently offer; new pricing where applicable (i.e. unfortunately universal); and availability. At this time, we must have full payment when you place an order so that we can get you in line with our distributors. Your modules will ship as soon as our distributor has modules to fill your order. Please understand that prices may change at any time without notice

SHELL ULTRA SQ80P, SQ165P and SQ175P SHELL HAS RENAMED THE SQ LINE OF MODULES. THEY ARE NOW THE ULTRA SERIES BUT IT IS OUR UNDERSTANDING THAT SQ STILL APPEARS ON THE LABEL.

Ultra SQ80-P



Ultra SQ165-P and Ultra SQ175-P



SHELL residential power modules use quality single crystal cells. Tempered glass front and aluminum mounting frame. Single junction box on the SQ80-P accepts our special [solar 2 wire](#), or flexible conduit. The Ultra SQ165-P and SQ175-P have MC cable leads already attached to its junction box. We provide a free 30' MC cable with a male and female end. You cut this cable in half in order to plug it into the pre-installed MC cables and run from there to a combiner box. Tested at 50 PSI wind load; 1" hailstones impact at 52mph. Shell is the highest quality construction. **We have had no warranty returns or claims in over 20 years of selling Shell products.**

TWENTY FIVE YEAR WARRANTY on power output.

AS OF MAY 1, 2005 THE SHELL ULTRA SQ80-P MODULES ARE BACKORDERED AND WE HONESTLY HAVE NO IDEA WHEN WE WILL RECEIVE OUR NEXT SHIPMENT. WE WILL NOT ACCEPT ORDERS FOR THIS MODULE UNTIL FURTHER NOTICE. PLEASE STAY IN TOUCH AS WE HOPE TO KNOW MORE BY JANUARY.

AT THIS TIME, 10-18-2005, We have a limited number of Ultra SQ165 modules in stock. We may have more ULTRA SQ175 MODULES in stock by the end of November. HOWEVER IT IS OK TO ORDER THEM AND GET IN LINE. ALSO NOTE THAT THE SQ165 AND SQ175 ARE ONLY SOLD IN BOXES OF FOUR AS OF 8-19-2005.

Item #	Watts	Amps	Volts	Size Inches	Weight	Price
Ultra SQ80P	80	4.76	16.9	47.3 x 20.8	16 LBS.	Single Module ???
						2 or more ???
Ultra SQ 165P 24 volt	165	4.72	35.0	63.9 x 32.1	38 LBS	Box of 4 only \$3240 per box \$810 per module
Ultra SQ 175P 24 volt	175	4.95	35.4	63.9 x 32.1	38 LBS.	Box of 4 only \$3440 per box \$860 per module

Price per 12v ampere for comparison: Ultra SQ165 is \$86.87; Ultra SQ 175 is 86.87

Ultra SQ80P: FREE UPS SHIPPING IN LOWER 48 STATES
 Ultra SQ165/Ultra SQ175 ship truck freight; Call for freight quote.
 All other locations contact us for shipping arrangements

Introducing EVERGREEN SOLAR

Cedar Series Photovoltaic Modules: made in the USA

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Designed for maximum performance: safe, reliable, versatile and easy to install.

Easier, faster more accurate wiring

- Sealed junction box never needs maintenance.
- Easy, accurate, reliable electrical connections
- Comes with factory-installed MC cables, connectors, and bypass diodes. **Backwoods Solar includes a free 30' MC cable with a male and a female end with each Evergreen module ordered. This cable is designed to be cut in half in order to connect to the EV110s MC cables and then run to a combiner box.**

Predictable, reliable, long-term performance

- Each module is individually tested to ensure field performance meets or exceeds specifications.
- Solar cells are matched to reduce internal losses and the possibility of hot spots.
- Rugged, durable anodized aluminum frame makes for strong, stable mechanical mounting.
- Industry standard EVA (Ethyl Vinyl Acetate) and Tedlar™ construction protects solar cells from mechanical and environmental stress.

25 year limited power warranty.

Advanced technology with promise for the future

- String Ribbon™ polycrystalline solar cells outperform thin films and achieve comparable performance to bulk crystalline technologies while using half as much silicon.
- The proprietary cell fabrication process is among the most environmentally friendly in the business.

The power of PV

- Photovoltaics (PV) provide clean, quiet, reliable electricity from sunlight.
- No moving parts to wear out.
- No emissions - power that's good for the environment.
- The Sun - a limitless, readily-available power source.

Backwoods Solar should have Evergreen Solar modules available by October 21, 2005. Please order in advance to insure your place in line. We hope to have 40 of the EV110 on a monthly basis however we cannot guarantee that Evergreen will continue to ship as they have historically. Evergreen Solar offers a 110 watt and a 115 watt module. At this time we believe that we will only receive the 110 watt modules. However if we do receive 115 watt modules, we will ship those modules to you as a free upgrade. We cannot guarantee that you will receive a 110 or a 115 watt module. We will ship what we receive for the price of an EV110!!

Item # & Rated Power	Current at max power	Voltage at max power	Open circuit voltage	Size in inches	Shipping Wt.	PRICE
EV-110 110 watts	6.4 amps	17.2 volts	21.5 volts	62.5 x 25.69	28 lbs.	\$640 ea.

Price per ampere for comparison: EV110 is \$100.00.



Backwoods Solar includes a free 30' MC cable with a male and a female end with each Evergreen module ordered. This cable is designed to be cut in half in order to connect to the EV110s MC cables and then run to a combiner box.

FREE UPS SHIPPING IN LOWER 48 STATES
All other locations contact us for shipping arrangements

KYOCERA

As of 10-01-2005 we do not have any KC60, KC80, or KC120 modules in stock. We do not believe that we will receive any more of these particular modules. In their place, Kyocera has introduced their new line of dark blue modules which we review below.

NEW from KYOCERA



Kyocera's advanced cell-processing technology and automated production facilities produce highly efficient multi-crystal photovoltaic modules. To protect the cells from the most severe environmental conditions, they are encapsulated between a tempered glass cover and an EVA pottant with a PVF back sheet. The entire laminate is installed in an anodized aluminum frame for structural strength and ease of installation.

d.Blue Module

Kyocera has perfected its new surface treatment technology and is introducing it on a new line of modules named d.Blue, for its dark blue color.

The newly developed treatment method processes multi-crystalline silicon cells in order to produce a surface texture that minimizes surface reflectance and maximizes output. The result is a maximum conversion efficiency of 15 %, one of the highest conversion efficiencies in the polycrystalline module industry.

d.Blue is ideal for installation on all types of buildings, from residential to large scale commercial systems. The stylish dark blue cells, combined with black module frames, allow the modules to blend in with the buildings architecture while producing energy at exceptional efficiencies.

The d.Blue modules are available in 125, 85, and 65 watt panels. All feature conventional junction boxes, a heavy-duty box-style anodized aluminum frame; and an industry high 25-year power output warranty.

Our limited supply of KC125 modules due by October1, 2005 have sold out. We hope to have some KC125, KC65 and KC85 modules by November. In general though an 8 week lead time is not unusual. Orders now being accepted.

Item # & Rated Power	Current at max power	Voltage at max power	Open circuit voltage	Size in inches	Shipping Wt.	PRICE
KC65T 65 watts	3.64 amps	17.9 volts	21.8 volts	29.6 x 25.7	13.2 lbs.	\$395 ea.
KC85T 85 watts	4.75 amps	17.9 volts	21.8 volts	39.6 x 25.7	18.3 lbs	\$495 ea.
KC125TM 125 watts	7.20 amps	17.4 volts	21.7 volts	56.1 x 25.7	26.8 lbs.	\$695 ea.

Price per ampere for comparison: KC65 is \$108.52; KC85 is \$104.21, and the KC125 is \$96.53.

FREE UPS SHIPPING IN LOWER 48 STATES
All other locations contact us for shipping arrangements

UNISOLAR

Lighter, unbreakable amorphous (non-crystal) silicon without glass front.

UniSolar framed panels are glass-free modules encapsulated in UV-stabilized polymers and framed with anodized aluminum. A steel sheet backing provides stiffness to the module.

US/64 modules are equipped with weather-resistant junction boxes to accept 1/2 inch conduit or wire fittings.

UniSolar uses a triple layer junction to achieve highest efficiencies for amorphous panels. These have larger surface area per watt than crystal modules. Without glass these can be hit and even punctured without destroying the module as when a glass module shatters.



Amorphous silicon modules start with a bit higher than rated power, then settle to the rated power within weeks and remain stable at that level for their life. Amorphous silicon does not reduce voltage due to heat, so they equal the performance of higher voltage crystal cell modules. Smaller modules have wire leads, and are suitable for powering a fan, fountain, fence charger, etc...

Warranty: 20 year limited on US/64

As of October 18, 2005, we have 8 US64 watt modules in stock. It may be next year before we receive more. It is ok to order though.

ITEM #	WATT	AMP	VOLT	INCHES	WEIGHT LBS	PRICE
S-US64	64	3.88	16.5	53.8 x 29.2	20.2	\$390

Price per ampere for comparison: US64 is \$100.52;

FREE UPS SHIPPING IN LOWER 48 STATES
All other locations contact us for shipping arrangements

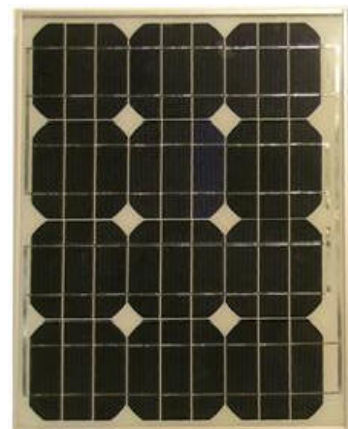
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In light of Unisolar's decision to discontinue manufacturing their smaller modules, we have decided to offer this new line of modules which are manufactured in India specifically for AEE Solar. AEE Solar has operated out of its California headquarters for over 20 years and will honor any warranty claims arising against these modules. Please do not hesitate to buy these modules due to their point of origin. To date we have sold dozens without an out of the box issue.

INDIA PV 5, 10, and 20 watt Modules

These Small Glass and Aluminum Framed modules are glass laminated in aluminum frames with a small junction box on the back. Sturdy frames and tempered glass. These modules have a ten year warranty.

ITEM #	WATT	AMP	VOLT	INCHES	PRICE
S-INDIA PV20	20	1.22	16.4	21.3 x 17.7	\$175



S-INDIA PV10	12	0.61	16.4	17.4 x 11.4	\$115
S-INDIA PV5	5	0.31	16.4	16.8 x 6.1	\$70

Price per ampere for comparison: PV20 is \$143.44; PV10 is \$188.53; PV5 is \$225.81

FREE UPS SHIPPING IN LOWER 48 STATES

All other locations contact us for shipping arrangements

ALL about BATTERIES

BATTERY CARE is your main responsibility with home made electricity. This component is the one part of your power system likely to be harmed by neglect or misuse. Lead-acid batteries, the standard in home energy, should not be discharged more than 50%. Ideally, they should be recharged to 100% promptly. They can be damaged by undercharging, continued overcharging, or contamination.

Common causes of battery failure are sulfate buildup, loss of electrolyte, undercharging, and old age. As batteries discharge, lead sulfate forms on a battery's positive plate. In principle, recharging converts the lead sulfate back to its component material – lead, lead dioxide, and sulfuric acid. However as batteries age, recharging has a more difficult time converting lead sulfate and it can crystallize. This buildup is accelerated by temperatures over 70 degrees; discharging a 2 volt battery cell below 1.75 volts; and extended storage or use without a 100% recharge.

Loss of water within the electrolyte solution is a natural process which occurs during the recharging process and if not corrected can lead to plate exposure and oxidation. Repeated undercharging causes lead sulfate to harden and crystallize on the positive plates. And as batteries age, plate material sheds and falls to the bottom of the battery eventually shorting the plates. This shedding is accelerated by sulfate buildup.

On a daily basis, Backwoods Solar discusses the state of charge of a battery bank with our customers. On many occasions we hear that a battery meter such as the Trimetric Battery Monitor indicates a battery bank is almost full but loads on that bank are behaving as though the battery state of charge is low. We ask if the Trimetric's reading has been confirmed with an hydrometer which measures the specific gravity of the battery's electrolyte, and almost universally it has not. This mistake can have an irreversible and negative affect on a battery bank if not detected within a few short weeks.

Please realize that these meters are only as good as the programming which gets entered into them and it is critical that an hydrometer is used in conjunction with a Trimetric meter for the first several months to confirm that the Trimetric is accurately programmed. As the Trimetric and hydrometer readings are compared, the Trimetric's parameters can be tweaked to insure that what it is telling you is reliable. The Trimetric is a great visual aid and once programmed properly can be relied on for weeks at a time but you should always return to the hydrometer every few months to guarantee that something hasn't gone wrong.

The vast majority of the batteries that Backwoods Solar sells are the Trojan flooded lead acid batteries. Trojan has given us permission to insert two PDF links which we find informative and extremely helpful when it comes to battery care. One article discusses Deep Cycle Battery Maintenance and the other article is an interesting read on

Photovoltaic Battery Charging. Please take the time to download these articles and heed the advice presented in the Maintenance guide.

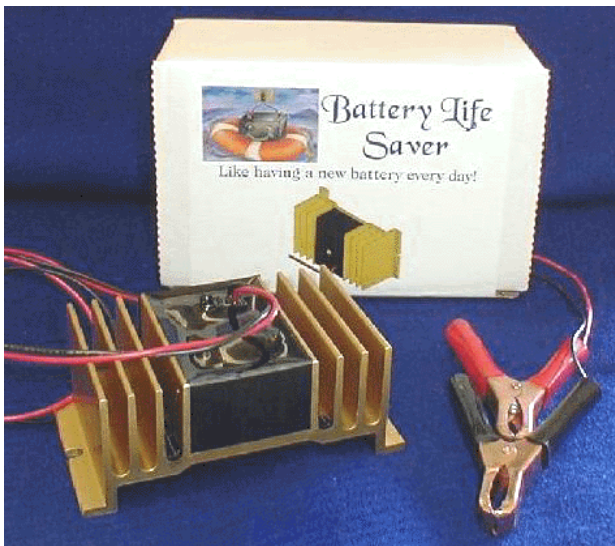
REMEMBER: Do not store batteries without periodic recharging. Continual self discharge when not in use can ruin even a brand new set of batteries.

To facilitate the care of your battery bank, Backwoods Solar has decided to add two new products to our offerings: The **Water Miser Battery Vent Cap** and the **Battery Life Saver De-Sulfator**.



The **Water Miser Battery Vent Caps** replace the original battery caps which screw into the individual cells of your batteries. One vent cap is needed per cell. These caps are designed to reduce battery maintenance by decreasing the frequency with which distilled water needs to be added. Each cap has condensing pellets within its flip top lid which capture and return electrolyte droplets into each cell as battery charging takes place. This process does **NOT** eliminate the need to add distilled water nor alleviate your need to diligently monitor water levels and specific gravity but it does reduce the overall amount of water added and alleviates some of the minute electrolyte mist which can settle atop a battery.

B-Water Miser: \$6.00 per cap



The **Battery Life Saver De-Sulfator** is one of several pulsing style battery conditioners on the market. Despite the fact that battery guru, Richard Perez, of Homepower Magazine insists that a De-sulfator is an essential battery bank component, Backwoods Solar has resisted this technology for many years as we have not been able to prove to ourselves that these devices actually work. That is until we were introduced to the **Battery Life Saver De-Sulfator** and the test results provided by Backwoods employee, Tom Kingsland.

The manufacturer of the **Battery Life Saver De-Sulfator** insists that their device can help alleviate the problems of sulfation. The device purportedly sends a square wave frequency signal to each crystal of lead sulfate, causing it to convert back into lead and sulfuric acid, thus dissolving the crystal. The end result: longer battery life!

Given our skepticism, Why have we decided to sell this device? Back to Tom's test.

Tom has twelve Trojan T105 batteries which are 6 years and a few months old. He charges them with two Outback VFX3524 inverters and/or a 1200 watt PV array. Prior to connecting the **Battery Life Saver De-Sulfator** he followed a regular charging regimen which included regular equalization. However, like most folks, on occasion Tom's batteries would have been too deeply discharged and not immediately fully recharged. After 6 years, the majority of his batteries simply would not reach a full state of charge based on specific gravity (SG) readings, and overnight voltage drop was a significant one plus volt or more. So immediately prior to adding the **Battery Life Saver De-Sulfator** he tenaciously charged those 12 T105s with his generator and PV array for days and recorded temp compensated SG readings. Same results: fewer than half of the cells reached 1.260 or higher on his hydrometer. So he connected "the device!" For nine skeptical weeks it sat there doing its frequency signaling thing and then temp compensated SG readings were again taken. Low and behold, every cell, yes every cell had SG readings of 1.265 or higher and his overnight voltage drop, with similar night time loads, has been reduced to a few tenths of a volt.

A colored, graphic display of Tom's test results is posted as a PDF link on this Newsletter web page

So with optimistic trepidation, we now offer the **Battery Life Saver De-Sulfator**. The small financial investment certainly seems worth the potential gain. Installation is simple as battery clips connect to your main (+) and (-) battery posts or cut these clips and hard wire in place. The reverse polarity protected, potted electronics are set on an anodized aluminum heat sink. The device measures 4.5" wide x 2.25" deep x 2.0" high and weighs 11.4 ounces. One year warranty.

The **BLS-12A** for 12v systems draws 100 milliamps and sells for \$48.00.

The **BLS-12/24B** for 24v systems draws 250 milliamps and sells for \$48.00.

The **BLS-48A** for 48v systems draws 500 milliamps and also sells for \$48.00.

Shipping on all units to a lower 48 address is \$6.00 per unit.

We welcome any and all test result based feedback as we continue to monitor the effectiveness of this device.

Business Briefs and Product Sales

Sunfrost Price Hike • New Home Energy Diet Book

10% Off Cozy Direct Vent Wall Heaters

10% Off all 12v DC Bedwarmers

Sunfrost has finally raised its prices after at least eight years without a single price hike.

Effective immediately, the following prices will apply to the purchase of a 12 or 24 volt DC powered Sunfrost:

RF19: \$2950.00

R19: \$2659.00

F19: \$2980.00

RF16: \$2805.00

RF12: \$2059.00

R10: \$1595.00

F10: \$1700.00



Standard color is white. For most Custom colors and wood veneers add \$150.00. There may be additional charges for some specialized colors and wood veneers.

For 120v AC models, deduct \$70.00 for single compressor models and \$140.00 for dual compressor models.

Base Cabinets

Size	White	Color or Wood
4" stand	\$79.00	\$95.00
13" cabinet	\$275.00	\$335.00
24" cabinet	\$320.00	\$380.00

A \$60.00 crating fee is added to each refrigerator ordered. Truck freight charges will be added. Sales tax is charged for California and Idaho purchases. Current lead time: 12 weeks. Payment in full is due when order is placed.

Due to size, our 30 day return privilege does not apply to a Sunfrost purchase.

The Home Energy Diet

How to Save Money by Making Your House Energy-Smart

By Paul Scheckel

With rising energy costs, homeowners are beginning to examine the energy efficiency of their own homes, asking questions that range from where energy comes from and how much it costs, to how to choose new appliances and what options exist for renewable energy?

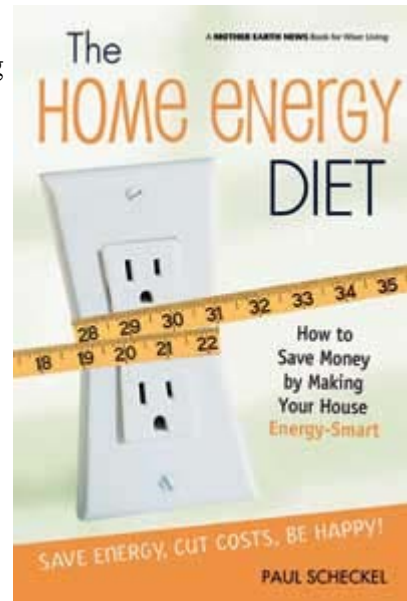
The Home Energy Diet answers all these questions and more, while helping readers take control of their personal energy use and costs so they can save money, live more comfortably, and help the environment. Energy auditor Paul Scheckel first explores energy literacy, and then describes how your home uses - and loses - energy you pay for via:

- Electricity
- Hot water
- Heating and air conditioning, and
- Windows, walls and insulation.

The Home Energy Diet involves readers in learning about their own homes by measuring, metering, investigating, and considering habits related to household energy use, then learning how to quantify energy consumption and cost, and to make informed decisions about cost-effective improvements and upgrades. The book explores the misunderstood concept of efficiency versus cost by comparing fuel costs and equipment choices, including the possibility of using renewable energy for meeting home energy needs. This authoritative guide makes efficiency fun through personal anecdotes and humorous "tales-from-the-basement" energy misadventures.

Since energy efficiency is an investment that offers returns greater than Wall Street, readers can earn several hundred dollars every year just by following the advice in this book. As a bonus, many of the energy-saving strategies described can make for improved indoor air quality and healthier, more comfortable homes.

- A Mother Earth News Book for Wiser Living -



Paperback - 304 pages
Width: 6 Inches x Height: 9
Inches

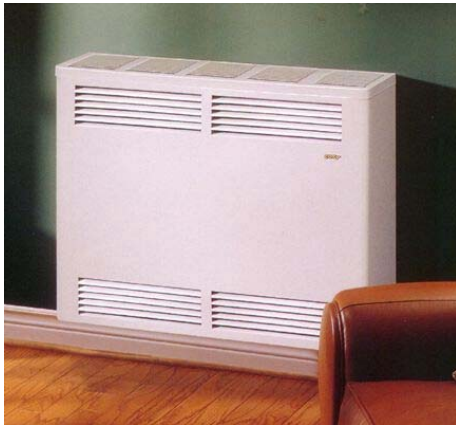
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E-Home Energy
\$18

10% off Cozy Direct Vent Wall Heaters through January 30th, 2006

"COZY" WALL VENTED HEATERS

Make the heat where it is needed without electricity. Each heater has a wall mounted thermostat to set the temperature of an individual area as needed.



CDV 256/336 unit is shown here
CDV 156 looks like half of this CDV
pictured

NO ELECTRICITY NEEDED. The Cozy Wall Furnace vents through an outside wall behind the heater. Sealed combustion unit draws air from outside and exhausts back to the outside. It draws no air from the room, and puts no exhaust into the room. The burner is all stainless steel, with a 10 year warranty on the burner and the sealed combustion unit. **Finish is WHITE.** Push button

spark pilot lighting. Listed models have wall mounted thermostat for even room temperature, but you can add the much superior digital timer/control below.

An AC fan kit is available for CDV25 and CDV33, but we believe it is better to add two DC muffan fans for much lower power use.

The 9" diameter vent pipe fits walls 5" to 9" thick; an optional extension kit can be purchased which would go through a 15" thick. Overall efficiency is about 66%.

Model	BTU/Hour Estimated Heating Ability	Width x Ht X Depth	Shipping Weight	SALE Price
A-CDV156	15,000 450 sq. ft.	18" x 28-1/4" x 9-3/4"	70 lbs	\$570
A-CDV256	25,000 750 sq. ft.	34-1/2" x 31- 1/2" x 9-3/4"	99lbs	\$690
A-CDV336	33,000 1,000 sq. ft.	34-1/2" x 31- 1/2" x 9-3/4"	99 lbs	\$735

Set for propane. For Natural Gas, please specify so we order the correct model.

Shipped truck freight because of size: Please call for freight cost.

30 day return privilege does not apply to these appliances.



Backwoods Solar recommends this superior digital thermostat for the Cozy heaters

O-THERM 9610 same with clock-set temperature changes, allows setting morning heat, later cooler, evening heat, and night reduction, plus two of these can skip weekends.: **\$53**

10% off 12 VOLT DC BED WARMERS through January 30th, 2006



12 VOLT ELECTRIC BED HEATER PADS go on the mattress to warm you from underneath. We use ours if we come home to a cold house, running a half hour before bed time to preheat, then turn it off after entering bed. Low wattage heat takes a while to get hot, but given time it gets plenty warm. It runs full time

during flu or colds where a good hot bed really makes a difference. We use one in the camper van on the road in winter. Heating pads are 50/50 cotton/poly, more durable than electric blankets.

Thermostat control responds to room temperature, cycling on and off to maintain the temperature setting. Conventional electric blankets use 200 watts, but these DC bedwarmers use under 60 watts and they avoid questionable AC magnetic field exposure. Running current is about 5 amperes on mid size pads, but actual thermostat controlled "power on" cycle is under 50% duty time. Current used actually averages 2 to 3 amperes. It can overheat if folded, so pick the right size for your bed. One year warranty.

Please note that the TABLE of BEDWARMERS is continued on the next page

MODEL	SIZE INCHES	DESCRIPTION	SALE PRICE
A-Bed T24	24 x 60	Smaller Bunk	\$46
A-Bed T30	30 x 60	Single Bunk	\$48

A-Bed T36	36 x 60	Twin Bed	\$52
A-Bed T42	42 x 60	3/4 Full	\$56
A-Bed T54	54 x 60	Full	\$68
A-Bed T54 DUAL	54 x 60	Dual Control Full	\$80
A-Bed T60	60 x 60	Queen	\$77
A-Bed T60- DUAL	60 x 60	Dual Control Queen	\$85

AC only models available, special order - call for price

SHIPPING \$6 EACH