

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.

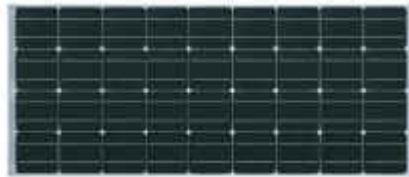
As Paula points out, grid-connected PV demand is artificial whereas the demand for off-grid PV applications is, in our opinion, economically practically in many situations. And in today's uncertain times, the sense of security and self-reliance garnered by producing

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, 11-04-2005, We have 24 ULTRA SQ175 MODULES and only 4 ULTRA SQ165 modules in stock. 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 has Evergreen Solar modules in stock as of November 04, 2005. 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. | \$604 ea. |

Price per ampere for comparison: EV110 is \$94.38.



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.

As of November 04, 2005 we have a limited supply of KC125 modules. We should have some KC65 and KC85 modules in December. 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.

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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 November 04, 2005, we do not have 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;

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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. We have plenty of each variety in stock.

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

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