

The Ultimate Free Solar System Buyer's Guide

This Summer An Army Of Solar Sales People Will Hit The Streets With The Single Goal In Mind Of Entering Your Home And Not Leaving Until They Get Your Signature On Their Airtight Contract!

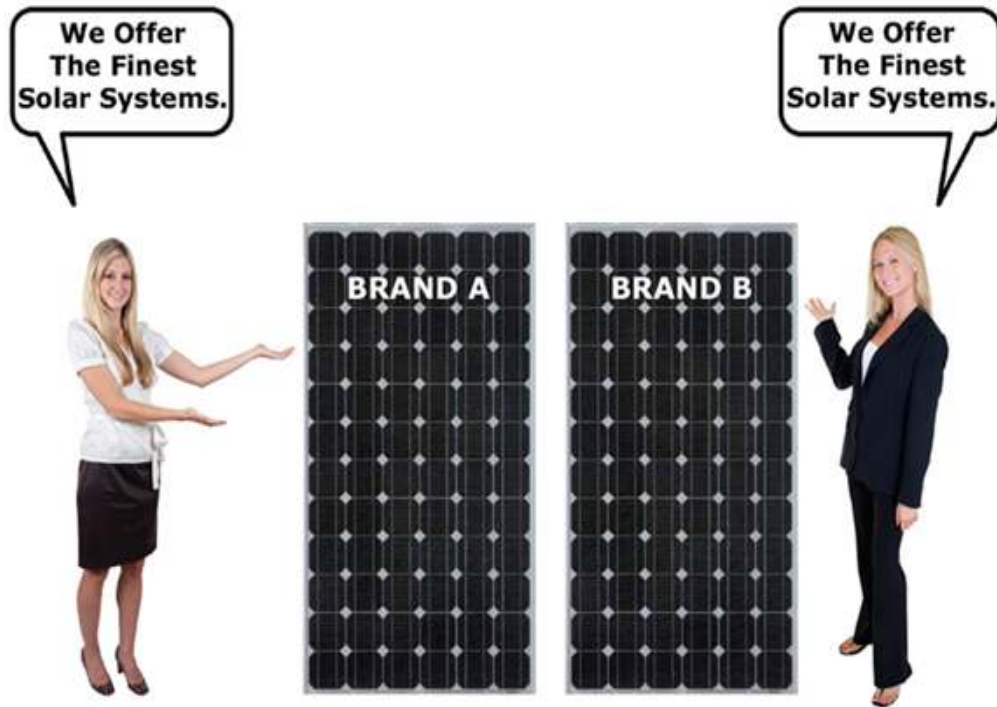


In the past year or two, everything from landscaping companies to window companies to air conditioning companies have magically morphed into solar dealers. When you talk to these companies, you'll find that many of them share several similarities. Some will falsely claim to have years or even decades of experience in the solar industry and all of them claim to offer the best solar products on the market.

Buying a solar panel system from any dealer, no matter how reputable they may seem, without preparing yourself with some basic knowledge, has the potential of turning into your solar investment into one of the worst investments that you will make in your lifetime.

Here's A Few Myths And Misconception That Are Currently Permeating The Solar Market:

1. The Samples That Several Solar Dealers Have Shown Me Looked Like They Were High Quality Products....



Hundreds of solar panel manufacturers from all over the world have literally invaded the U.S. over the past two years. Everything from the finest solar panels to the worst solar junk is being sold to consumers every day, all over the U.S.

The biggest problem that most consumers face is that it's literally impossible to visually tell the difference between a truly high quality solar panel that will last decades and a poor quality solar panel that might last 3 or 4 years. Even seasoned experts in the industry can have difficulty telling the difference.

The thickness and quality of the glass, the grade of the aluminum used in the frame, the quality of the EVA (Ethylene Vinyl Acetate) that is used to encapsulate and protect the solar cells, the grade of tabbing wire and solder that is used to interconnect the solar cells, the durability of the diodes and junction box, the quality and efficiency of the solar cells, all of these considerations can make or break your solar investment in as little as a few years if the right materials are not used.

2. I've Had Good Luck With My Favorite Brand Of TV, So They Must Make A Good Solar Panel As Well..... Right?



Unfortunately, what most people tend to do is stick with a brand name that they recognize. Maybe their favorite brand of TV or other household appliance. The problem is that some of the **worst performing** solar panels on the market are manufactured by some of the **biggest, most recognizable names in the industry**. Relying on brand name alone is one of the worst ways to invest in a solar system.

3. Shouldn't I Trust My Solar Salesman, He Seems So Honest ?



Honesty, obviously does play an important role when dealing with any solar company but dealing with an honest and experienced sales person is far more critical. Solar is a fairly high tech product which requires at least a basic understanding of the technology in order to provide an accurate sales presentation. This is all the more reason why you as a consumer absolutely needs to understand the basics. Solar isn't rocket science and the most critical considerations can be learned in minutes. The key to successfully buying the right system for your home or business is that you never want to be in a situation where your sales person knows or thinks he knows far more than you do about the technology.

So How Can You Tell The Difference Between Hype And The Facts?



The only way for a consumer to protect him or herself is to take a few minutes to become educated on what to look for when buying a solar system.

Here's eight rock solid, industry recognized, solar panel buying guide tips that you absolutely must consider before signing a contract for a solar system with any dealer. These considerations are so important in fact, that if you buy a solar system from any dealer without considering **all eight** of the following criteria, **then you might as well be wearing a blindfold** when you sign your contract and hand your dealer a **blank check** while you're at hit.

Before we get started, we'd like to go over what is considered the golden rule of buying any product in any young, rapidly growing, high tech industry:

"Never, ever accept the word of any salesperson as fact. Always ask your salesperson to produce original, factory or government printed documents to back his or her claims concerning his or her offerings"

No Matter Which Dealer You Buy Your Solar System From, This Solar Panel Buyers Guide Can Easily Save You Thousands!

1. NAME BRAND

Minimum Criteria: A large publicly traded, foreign government sponsored or large U.S. based manufacturer.

How To Verify This Information: Always ask for the manufacturer's stock symbol, sponsoring government identity or U.S. solar panel manufacturing facility address.

With the flood of solar panels that are entering the U.S. market that are coming from hundreds of tiny, financially unsound overseas manufacturers, it is important that you stick with the big name brands. By the term "big name brands" we mean large publicly traded, foreign government sponsored or large U.S. based manufacturers.

The reason for this is simple. **"Financial Strength"** If a catastrophic manufacturing defect were to occur and a major portion of a manufacturer's production were to result in a recall, it would be highly unlikely that a small privately held overseas company would be able to survive the replacement of even a moderate portion of their production. In a case like this, most of these small manufacturers would simply file bankruptcy and would re-open under a different name, which would result in the loss of your warranty protection. A larger publicly traded, foreign government sponsored or U.S. based manufacturer would be far more likely to possess the financial strength to honor their warranty.

Case in point: REC® Solar, a very large European solar manufacturer began selling solar modules in the U.S. about a year ago. In 2009 it was announced that the junction boxes that they were using had a serious defect which affected approximately 420,000 solar panels which represents about a quarter of their 2007 production and nearly all of their 2008 production. REC® Solar has accepted full responsibility and has launched a recall and will repair or replace all of the affected modules. Now keep in mind REC® Solar is one of the world's most well funded companies that uses the latest high tech manufacturing equipment available. This will cost REC® Solar approximately \$56 million dollars to correct.

If you purchased non name brand solar panels that were manufactured by a small underfunded company in an attempt to save a few nickels per watt, and this would have happened, even on a much smaller scale, the plain and simple reality would be that your chances of having your defective solar panels replaced under warranty would be almost zero.

2. PTC RATING This Is Absolutely Critical!

Minimum Criteria: A PTC to STC ratio of at least 90.0%.

How To Verify This Information: Visit the following government sponsored website to compare PTC ratings.

http://www.gosolarcalifornia.ca.gov/equipment/pv_modules.php

There are two different performance ratings that are associated with a solar panel. One is the STC rating or (Standard Test Conditions) and the other is the PTC rating or (PVUSA Test Conditions). The STC rating is a standardized test that is performed by the factory and is sometimes referred to as (Factory Test Conditions) and is basically the same as the label that is placed by the factory on the back of the solar panel. So if the factory test results indicated that a solar panel produces approximately 200 watts, then the factory will place a 200 watt label on the back of the solar panel. STC are 1,000 Watts per square meter solar irradiance, 25 degrees C cell temperature, air mass equal to 1.5, and ASTM G173-03 standard spectrum.

PVUSA test conditions were developed to test and compare PV systems as part of the PVUSA or (Photovoltaics for Utility Scale Applications) project. PTC are 1,000 Watts per square meter solar irradiance, 20 degrees C air temperature, and wind speed of 1 meter per second at 10 meters above ground level.

The PTC rating, which is lower than the STC rating, is generally recognized as a more realistic measure of PV (solar panel) output because the test conditions better reflect "real-world" solar and climatic conditions, compared to the STC rating.

This all may sound rather complicated, so to simplify: The higher the PTC rating the better the real world performance. The great news is that a list has been prepared by the State of California which shows the PTC rating of most solar panels so you can easily do a side by side comparison.

To calculate a PTC to STC ratio, simply divide the solar panel's PTC rating by its STC rating. For example if a solar panel has a 200 watt STC rating (Factory name plate rating) and a PTC rating of 175.7 Watts then it has a PTC to STC ratio of .8785 or 87.85 percent.

Again the point to remember is **"The higher the PTC to STC ratio the better the real world PTC performance"**

3. NEGATIVE TOLERANCE This Is Also Absolutely Critical!

Minimum Criteria: Negative 3%.

How To Verify This Information: Always check the manufacturer's specification sheet. (The lower this number the better)

Negative tolerance used to be one of the industry's best kept secrets. And is still a subject that some big name manufacturers try to avoid. The negative tolerance rating of a solar panel is the amount of power that a solar panel can be "off specification", even though it's new, right out of the box.

For example if you purchased a 200 watt solar panel with a 9% negative tolerance rating then that solar panel might provide only 182 watts and the manufacturer would consider this within normal specifications.

If the same 200 watt solar panel had a 5% negative tolerance rating then that panel might only produce 190 watts and would still be considered normal by the manufacturer.

3% might be only produce 194 watts. So as you can see, the lower the negative tolerance rating the better the guaranty you have of getting the power that you paid for.

If this little known fact weren't bad enough consider this: Because the typical solar system's panels are wired in a series string or series chain configuration, all it would take is for one solar panel to be off by 5% and that one solar panel will pull down the performance of every other solar panel in the chain.

Shopping Tip: You might hear a sales representative claim that his or her solar panels are "the most powerful solar panels in the world" because they offer higher efficiency. This may sound great on the surface, but if that same "higher efficiency" solar panel also offers a poorer negative tolerance rating then this can make the solar panel's claim of higher efficiency nearly worthless, especially if you're being quoted a premium for those "higher efficiency" solar panels.

4. WARRANTY

Minimum Criteria: 25 year factory warranty.

How To Verify This Information: Always check the manufacturer's written warranty policy.

A solar panel's warranty is becoming an ever more important issue which unfortunately is typically ignored by most consumers. Most solar panel manufacturers offer a 25 year power production warranty. There are several important things to consider when discussing a solar panel manufacturer's warranty.

1. Never take for granted the financial strength of the company that's backing a solar panel's warranty. Hundreds if not thousands of U.S. consumers purchased solar panels this year that were manufactured by tiny, non-name brand, overseas manufacturers that probably will not have enforceable warranties in the next 3 to 5 years.
2. If your dealer is trying to sell you a solar panel that offers less than a 25 year manufacturer's warranty while almost every other manufacturer in the industry offers 25 years, ask your dealer why his manufacture offers a lesser warranty. When you consider that a solar panel should offer a 30 to 40 year life expectancy, why would a manufacturer offer less warranty support?

Is there's something that they're not telling you about the life expectancy of their solar panel? You would be surprised at how many people in your neighborhood bought solar panels this year with only a 20 year warranty when they could have easily paid less for higher performance, name brand solar panels that offer 25 year warranties.

The bottom line here is, always ask your dealer to show you a copy of the **manufacturers written warranty policy**. Never assume that you're receiving a 25 year factory warranty.

3. Who is actually providing the warranty for your solar panels? Several dealers have begun the practice of selling factory defective solar panels that offer **no factory warranty** whatsoever. These small dealers, many of whom are home based businesses are private labeling factory reject solar panels that have no U.L. approval and are actually printing their own 25 year dealer warranties. A non U.L. approved solar panel cannot legally be installed on an occupied dwelling which also means that you cannot apply for a rebate.

Again, always ask your dealer to show you a copy of the **manufacturer's written warranty policy**. Never assume that you're receiving a factory warranty.

5. INVERTER EFFICIENCY

Minimum Criteria: 95.5 %. This Is Also Absolutely Critical!

How To Verify This Information: Visit the following government sponsored website to compare inverter CEC efficiency ratings.
<http://www.gosolarcalifornia.ca.gov/equipment/inverter.php>

Unlike a solar panel's efficiency which has very little impact on payback in a typical sunny environment. Inverter efficiency is directly related to a solar system's financial payback. The lower the inverter's efficiency, the smaller your rebate in many states and the lower the amount of energy that you will produce over the system's lifetime.

There are literally tons of unsold, low efficiency inverters floating around the market, that have been picked up by dealers looking for a bargain to resell. Make absolutely sure that you know the CEC weighted efficiency rating of the inverter that is being used in your system. And make absolutely sure that you're being quoted the **CEC weighted efficiency and not the inverter's peak efficiency rating**. When you consider that the inverter is very small part of your overall investment, compromising on efficiency in order to save a few hundred dollars up front, can cost you thousands or even tens of thousands of dollars worth of lost energy production over the life of your system.

6. MOUNTING SYSTEM DESIGN, THICKNESS AND WARRANTY.

Minimum Criteria: 6105-T5 Aluminum Extrusion With A 10 Year Warranty.

How To Verify This Information: Visit your dealer's showroom and ask to see a sample of the mounting system that will be used in your solar system and ask to see its specification sheet.

In an effort to save cost, several solar panel mounting system manufacturers have opted to use thinner gauge aluminum in the design of their mounting rails, choosing to push the limits of engineering instead of offering heavier duty, heavy gauge aluminum rails.

This might be beneficial to the dealer who is selling the solar system due to increased profit margins but in our opinion it offers absolutely no benefit to the consumer. In fact a thinner mounting rail requires that more holes are drilled into your roof so that more mounting points can be installed to provide the rigidity necessary to secure your solar panels.

A simple test that can be performed to compare one brand of rail against another is to lay a sample of the proposed mounting rail on the ground on its side and stand on it. If it bends to the point of damage then it is probably composed of thinner gauge aluminum. When you consider that the mounting rails that you choose is securing more than 90% of your solar investment to your roof, it's not really an area that you want to skimp on.

Amazingly some solar mounting system manufacturers don't even offer a warranty on their products. To protect yourself always ask your dealer to provide a copy of the written factory warranty for the solar mounting system that he or she is offering you. Never accept a dealer's warranty in lieu of the manufacturer's warranty.

When reviewing the quote that you have received from any dealer always make sure that the brand and model of the mounting system that will be used in your system is specified. If the dealer uses generic terms like "Includes solar mounting rack" or makes no mention of the mounting system at all, then the dealer will probably be using the lowest cost options available. Again, always demand to see in writing, the brand and model number of the mounting system that will be used in your solar system.

MOUNTING SYSTEMS CONTINUED:

Shopping Tip: A popular gimmick that is used by many solar dealers to enhance their price per watt is to sell name brand, solar panels and name brand, high performance inverters mixed with the lowest cost, thin aluminum, mounting system available on the market. Many dealers know that consumers typically focus on the name brand of the solar panels and the inverter and will pay no mind to the brand of the mounting system.

The bottom line is this: If you feel comfortable with the idea of securing more than 90% of your solar investment to the roof of your home with the cheapest, thinnest mounting rails on the market while drilling more holes into your roof in order to provide the rigidity needed to support your solar panels, so you can save a few pennies per watt, well then what can we say?

On the other hand, like most consumers, if you don't feel comfortable with that idea, then give the quote back to your dealer and ask him to upgrade your solar mounting system to a higher strength version. It is simply not worth the few pennies per watt that you might save to compromise your investment.

8. PRICE PER WATT

Minimum Criteria: No more than \$3.94 per watt (equipment only) or \$5.50 per watt (installed) for an standard string inverter based 4kW system. (The higher the system wattage, the lower the price per watt.)

How To verify This Information: Always ask for a written quote from any dealer. (always make absolutely sure that you are comparing apple for apples.)

Price per watt is a quick and easy way to compare two **identically sized and equipped** solar systems. To calculate price per watt, simply divide the price of the system before rebates and other government incentives by the wattage of the system.

For example if system (A) consisted of a 5.0 kilowatt system that was priced at \$19,020.00 then system (A) would have a price per watt of \$3.80 per watt. If system (B) consisted of a 5.0 kilowatt system that was priced at \$20,230.00 then system (B) would have a price per watt of \$4.04 per watt.

If both systems included identical solar panels, racks and inverter that were made by the same manufacturer, then obviously system (A) would be the better buy.

If system (B) included an inverter with a higher efficiency rating that gave you a bigger rebate and more power production over the life of the system and Higher Strength mounting racks and solar panels with a longer warranty, then system (A)'s lower price probably no longer makes sense.

Price per watt only makes sense when you're comparing apples to apples. Meaning same size, same manufacturer, same model and same warranty. If you're using price per watt to compare apples to oranges and it's the only tool that you are using to make your comparison, then it's real easy to get caught up in the "price equals value trap" and forget that you're buying a product that should be designed and built to provide you with 30 to 40 years of service.

When It Comes To Buying A Solar System, Value Is Not Measured By Pricing Alone. No two solar systems are created equal. Differences that may appear to be minor on the surface can mean the loss of tens of thousands of dollars worth of avoided utility bills over the 30 to 40 year life expectancy of a typical solar system.

When shopping for a solar system, you may find pricing that's 15 even 20 percent lower on non-name brand solar panels that have been manufactured by tiny, overseas manufactures that have a small likelihood of being here 25 years from now to honor their warranty. But over the long haul, any savings that you earn now will be absolutely worthless if your system provides you with 30 to 40 years of inferior performance or your left with non-working equipment and no warranty to protect your investment.

8. MODULE EFFICIENCY This Is The Least Important Criteria

Minimum Criteria: 13.5 %.

How To Verify This Information: Always check the manufacturer's specification sheet. (Don't confuse the cell efficiency with the module efficiency)

In most real world applications efficiency is really not that important, which is why we rate it last on our level of importance. The term efficiency is probably one of the most misused, misunderstood terms in the solar industry that can have multiple meanings depending on which salesman you happen to be talking to at the moment.

Some manufacturers will use the term efficiency to represent power as in "the most powerful solar panels in the universe" while failing to mention their relatively poor negative tolerance ratings and high cost. When it comes to a solar system's power rating, a 5kw system is a 5kw system, no matter what the efficiency rating is. Otherwise a higher efficiency 5kW system would be rated at 5.1kW or 5.2kW and so on.

Other manufacturers will avoid the term efficiency like the plague or will manipulate their ads so that they talk about the "high efficiency" that's used in their manufacturing process or how "thin and sleek" their solar panels are or that their solar panels offers the "highest efficiency" in their class. Never mind that their product's class offers one of the lowest efficiency ratings in the industry.

So what's the truth about efficiency? It's simple, the higher the efficiency that the solar panel offers, the smaller the solar panel. And since efficiencies only vary by a few percentage points from panel to panel, in most cases you are only talking about a difference of a few square inches.

So if your roof has sufficient space for the solar panels that you're considering, why pay thousands or even tens of thousands of dollars more for higher efficiency solar panels? On the other hand if you can buy solar panels that offer a higher efficiency rating at a lower price than lower efficiency solar panels, then why not.

The second truth about efficiency is that you may receive a very small advantage when operating your panels under low light conditions. But in reality how often will your system experience low light conditions? And again is that small advantage worth the thousands more that most "higher efficiency" solar panels garner.

When it comes to efficiency, it is far more important to consider the system overall efficiency which includes the PTC rating of the solar panels and the conversion efficiency rating of the inverter.

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