

SolarTown Learning - Solar Panels Add to the Value of Your Home (7/20/2011)

You just laid out a hefty chunk of change for [solar panels for your home](#). You feel like your new solar energy system is a great deal. Not only has your solar installer told you so, but also you have done your own payback calculations. You receive your solar energy rebates and tax credits but after a year, your job requires you to move to another state and you are not going to take your solar panels with you. Now you want to know whether the **solar energy system** you installed on your home has added any value to your home.

While some argue that **solar panels** are a tough sell to prospective home buyers, others say solar panels are almost irresistible considering the fragile state of the current economy and the inevitable energy bill savings associated with solar energy. And studies have been conducted to determine whether the installation of solar panels adds to your **home's resale value**. Though houses of course vary by size and location, these studies suggest that solar panels increase the value of your home.

SolarTown decided to conduct a study to probe whether solar energy systems add to the sales price of homes. Prices of recently sold solar and non-solar homes in Arizona were compared and analyzed to test whether solar homes sold at a premium. The homes were similar in every major aspect except for the presence of a rooftop **solar PV system** to provide energy for the house. And we considered that if a solar energy system adds to the value of the house, then how much do they add to the resale value of your home?

In this learning piece, we will focus on the effect that solar energy systems may have on your home's resale value. By entering the mind of the prospective homebuyer, we will see why solar panels are an attractive option for those looking to save money on energy bills.

The Housing Market Goes Solar

Since the first residential solar installations, PV systems have faced some opposition from aesthetically-minded individuals and communities who find the panels obtrusive and flat-out ugly. These folks traditionally employ a "not-in-my-backyard" mentality, meaning they don't want what they consider large ungainly pieces of equipment within their line of sight. Recent reports however show that for the most part, this argument is not persuasive for most folks.

Studies have provided evidence for the economic gains associated with solar panel installation. A study from April 2011 by the [Lawrence Berkeley National Laboratory](#) looked at home sales (both homes with solar systems and homes without) in California over an 8 ½ year period beginning in 2001. The study found strong evidence that California homes with PV systems sold for a premium ranging from \$3.90 to \$6.40 per watt of installed capacity over comparable homes without PV systems. The results from this study indicated that a solar home showed an extra \$5.50 per watt of solar



installed, with an average of \$17,000 of added value per house for a 3.1 kW solar system (the average system size of the study). A 3.1 kW system would now be considered very small for an average home. Most systems installed on homes

today are much larger. For the purposes of our comparison, we will assume a 5 kW system. Under the Berkeley Lab approach, the **added value to your home for a 5 kW system would be \$27,500**.

The study found that the solar premium for existing homes was almost twice as much as for new homes. Depending on how much you paid for your solar system, this additional premium can make solar power an even more appealing option, especially if you weren't planning on moving from your home. Remember however, that this study was conducted in California - the state that produces the most solar energy in the U.S. and whose prospective homeowners are solar-savvy. Would the same results hold for homes in a different state?

A study published in July 2011 by the [National Bureau of Economic Research](#) also shows that solar PV systems increase the value to homes. The researchers looked at homes located in San Diego and Sacramento counties, California and found that since 2003, solar energy systems were associated with an average **3.5% increase in resale value**. They did not convert this increase to a dollars per watt calculation, but we can make this estimate. They indicated that the homes in their study were valued in the mid \$500,000's so let's assume an average of \$550,000. They did not indicate the capacity of the solar systems that they looked at, but we will assume an average size of 5 kW, so we come up with an average increase of \$19,250 in value or **\$3.85 per watt**. For our detailed summary of this report, you can click on our [Solar News story](#) here.

An older study [by the National Association of Real Estate Appraisers](#) found that home values increase by an average of \$20 for every \$1 reduction in annual energy bills. So let's say that after tax credits, solar renewable energy credits (SRECs) and other incentives, the cost of your 5 kW solar system totals \$10,000. If this system provides enough energy to counteract your usual \$1000 per year energy bill, the system will have paid back for itself about 10 years - which is fairly standard for the majority of solar systems installed in the U.S. For the purpose of this example, let's say your job requires you to relocate after 2 years. Luckily, **your house should sell for an additional \$20,000** (1,000 x 20), allowing you to recoup all of your original capital investment. This 20:1 ratio may be a decent rule of thumb to predict the potential gains from going solar.

You can think of your PV system also in purely economic terms. If we take the same example, we can assume that you are saving \$1000 per year off of your energy bill (which you can now put in the bank for your grandkids), and the useful

life of your system is 25 years. If we use a discount rate of 5%, then **the present value, which is the value of this stream of cash flows, is \$14,000**, which is still \$4,000 more than you are out of pocket for the system. In these economic terms, your solar home should be worth \$14,000 more than the house next door which is sans solar panels.

Under each of these three approaches, you are still ahead, the only question is by how much. If the studies above haven't convinced you, we can take a look at anecdotal evidence. Here is a real life example: the proof is all in the numbers. Clarum Homes in Palo Alto, California developed a community with 257 environmentally friendly homes, each with installed solar panels. The results exceeded all expectations. All 257 homes sold out in the first year of being on the market, instead of the three years developers had planned. Initial home prices were advertised by Clarum Homes at \$379,000 to \$499,000 but some of the units sold for as much as \$600,000.

Solar Panels from the Homebuyer's Perspective

Solar panels don't just increase the value of your home, but also allow the home to sell faster, often spending half as much time on the market as a comparable home without panels, according to the [U.S. Department of Energy](#). Research shows that homeowners weigh energy costs as an extremely important factor in the decision to purchase a home. Energy-saving improvements make your house look more affordable to more people and attract attention in competitive real estate markets. Installing solar energy as a standard home feature simplifies the buyer's decision making process by taking much of the guesswork out of their purchase. Solar is a fixed energy source and buyers understand that by purchasing a solar house, they will not have to worry about problems with the energy grid or fluctuations in prices.

It may come as a surprise, but the homebuyers who purchase solar homes are your typical mainstream homebuyers with average price ranges. This means that a solar home won't appeal to just a niche demographic, but to a broader spectrum of prospective homebuyers. A study by [Solar Today](#) revealed that owners of homes with PV systems perceived three types of benefits: (1) that they were helping to combat climate change in a sustainable manner that didn't impact future generations, (2) financial reasons including reduced energy bills and increased home resale value, and (3) personal satisfaction and feelings of self-sufficiency. Prospective buyers will have similar perceived benefits and will likely gravitate towards buying a solar home for similar reasons.

SolarTown Study Shows Increase in Value for Solar Homes

It can't be ignored that much of the existing knowledge on this subject comes from California. California has a well-saturated solar market that provides a variety of incentives for homeowners to install solar systems on their homes. Prospective homebuyers in other states may not be as well informed about the benefits of solar, so it was interesting to

find out in our study whether these differences would fetch a higher or lower solar premium in a state like Arizona, where solar is just beginning to hit the mainstream.

Still have a guess in mind for how much you think solar panels would add to your home's resale value? After careful data collection and analysis of hundreds of Arizona homes, SolarTown found an average price increase of \$20,700, equivalent to a **\$7.20 per watt** premium of solar installed. So for our hypothetical 5 kW system, the **added value to your home is a eye-popping \$36,000**--if you live in Arizona. These results are more in line with the results of the Berkeley Lab approach and prove our hypothesis true - that despite the naysayers, solar panels significantly increase the selling price of your home. However, you shouldn't take these figures at face value and expect those exact monetary returns. Every real estate market is different and many are highly unstable because of our economic crisis. Therefore, what you should use these numbers as a baseline for calculating the benefits of solar.

Factors to Consider

Despite the empirical and real-world evidence, bad looking or poorly designed solar systems can still be a disincentive for others to buy your home. In markets where appraisers and realtors have little experience dealing with solar energy and where the solar market is poorly saturated, solar panel installations have dampened resale values. Often instead of seeing the economic benefits of buying a solar house, homebuyers just see panels as an added maintenance cost. But in well-informed markets with high solar installation concentrations, such as Arizona, California, New Jersey, and Florida, the selling price of homes with solar installed is quickly rising.

So when installing a solar system on your home, it is important to consider **three** factors: the **acceptance of solar** energy in your community, the **aesthetic details** of your solar system, including piping/wiring runs, panel colors, and exposed system components, and the current state of the **real estate market**. Even the most appealing solar home might be a tough sell in tough economic times or if prospective homebuyers in your region aren't well informed on the benefits of going solar. But if everything is good to go, you may be in for a pleasant surprise when it's time to sell your home.

Updated: August 4, 2011 (includes new National Bureau of Economic Research study) --
<http://www.solartown.com/learning/solar-policy-and-incentives/solar-panels-add-to-the-value-of-your-home/>