

# Your Solar Estate: *Healthy, Wealthy, And Easy*

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## synopsis

 Today's solar energy systems are based upon proven technologies, backed by major companies with long-term warranties, and installed by experienced professionals with minimal disruption to your home or life.

Any investment you make improving your home's energy efficiency will reduce the size of solar equipment investments needed to supply energy for your home.

 The main types of solar energy systems used on homes include solar electric (PV, or photovoltaics) to produce electricity, and solar thermal systems.

The increase in appraisal value for a home is about twenty (20) times the annual reduction in operating costs due to energy-efficiency measures.

Today, solar energy systems are finding their ways onto the homes of many Americans. These are relatively easy home improvements that add value to your home and help create a healthier living space. It's a more efficient, comfortable home that can "live" even when the power utility is down, and thrive when utility prices are rising.

Today's solar energy systems are based upon proven technologies, backed by major companies with long-term warranties, and installed by experienced professionals with minimal disruption to your home or life. Thereafter, your utility bills will be reduced and, perhaps more importantly, hedged against an uncertain energy future. And you will be adding value to your home. The appreciation in home value is significant and can even equal that of the installation expense.

## Healthy, Comfortable, Efficient Living Spaces

Energy-efficient homes are quiet, draft-free, comfortable living spaces. And any investment you make improving your home's energy efficiency will reduce the size of solar equipment investments needed to supply energy for your home. Therefore, while developing your solar energy installation plans, also consider your energy uses. Reducing your energy use and improving the efficient use of energy in your home is the most economically sound way to improve your home's energy situation. Energy-efficiency improvements might include improved insulation and

windows, compact fluorescent lighting (CFL), high-efficiency heating and cooling, on-demand water heating, and ENERGY STAR® appliances. These home improvements come with rapid financial paybacks and help improve the overall comfort of your home.

Look at your recent utility bills. What patterns do you see? Are you experiencing high heating bills in winter or high cooling bills in summer? If so, consider improving the efficiency of your space heating and/or cooling.

Also, understand how your utility bills are determined. Some utilities charge in “tiers.” This means the more energy you use, the higher your energy cost on a per unit basis (for example, per kilowatt per hour [kWh] of electricity and therm of natural gas). Energy-efficiency improvements can take you out of, or minimize, high-tiered rates, thus lowering your overall cost for energy. Or you may have time-of-use (TOU) charges. This means the rate your utility company charges you changes by season, day, or time of day. Generally, TOU is broken down into peak, part-peak, and off-peak rates. Peak rates are the most expensive and off-peak the least expensive. If you have TOU rates, by altering your energy-use patterns, you can dramatically reduce your energy charges. Consider using major appliances (like clothes washers) during off-peak times (usually evenings and weekends).

There are financial incentives and tax credits for energy-efficiency improvements. Most utilities offer free energy audits and online tools to help you determine what energy-efficiency improvements will help you most. There are also many professionals that specialize in home-energy audits and energy-efficiency improvements. Many of these same organizations also design and install solar energy systems.

## Resources:

- *DSIRE (www.dsireuse.org) is a free, online database that offers summaries of energy efficiency and solar equipment incentives that may be available to you.*
- *Home Energy magazine (www.homeenergy.org) and the American Council For An Energy-Efficient Economy (www.aceee.org) offer articles on the best practices for creating a clean, healthy, energy-efficient home.*

## Which Solar Technology?

The main types of solar energy systems used on homes include solar electric (PV, or photovoltaics) to produce electricity, and solar thermal systems. Solar thermal systems use the sun’s energy to produce usable heat. Solar thermal systems are used in a variety of applications, including solar domestic hot water (SDHW), solar pool and spa heating, and

solar space heating. Solar space heating is usually provided by water—heating systems that boost radiant floor-heating systems or ground-source heat pumps. But space heating can also be provided by direct air systems in an active or passive format. Active systems capture, store, and distribute heat provided by the sun. Passive systems generally utilize optimally designed windows and shading (for summer) to allow natural sunlight to enter living areas and heat the space.

Generally, solar thermal systems have a lower up-front cost and a faster financial payback as compared to PV systems. This is because solar thermal systems are efficient at converting the sun’s rays to heat energy for your home. The most economically attractive form of solar equipment installation is for pool or spa heating. The next most economically attractive is a solar domestic water-heating system.

PV systems, to be financially attractive, usually rely upon purchase incentives. There are Federal tax credits, and in many state and local markets PV systems have great incentives to help lower their up-front cost.

## Resource:

- *Visit [www.findsolar.com](http://www.findsolar.com) to help you determine what to expect from these various systems, including incentives that may be available to you.*

## Wealthy

Choosing to improve the energy efficiency of your home and installing a solar energy system is also a wise financial decision. The value of your home will appreciate and cash outflows and expenses will be reduced. Utility rates, solar incentive programs, and home values vary from market to market, so you’ll need to model your situation to see how solar adds up for you. Most solar professionals now use modeling software to estimate solar system performance and financial performance. You, as a consumer, can use free tools like [www.findsolar.com](http://www.findsolar.com) to begin the process.

## Financials: Home Appreciation

*The Appraisal Journal* found that “the increase in appraisal value for a home is about twenty (20) times the annual reduction in operating costs due to energy-efficiency measures.” These energy-efficiency improvements can come from the more efficient use of energy (like a new heating system) or through the installation of a solar energy system (which effectively reduces the utility energy demands of your home). In essence, a \$1,000 reduction in your annual energy bills can result in a \$20,000 increase in the value of your home upon

resale. The rationale is that money not spent on energy bills can be applied to an equity loan payment.

Pacific Gas & Electric (California) compares solar investment to other home improvements as follows:

### Financials: Cash Flow

Today, in almost all cases, solar energy systems have a financial payback period significantly shorter than the expected life of the solar energy system. And, in markets with strong solar incentives, many solar installations are cash positive from the start. This means the utility bill savings will be greater than the loan payments for the solar system. Even in markets with little or no solar incentives, many people find any additional out-of-pocket expenses are modest (about the cost of a cable TV subscription). Once the solar system loan is paid off, the utility bill savings result in a positive cash flow.

### Global Climate Change And Solar Energy Systems

Global climate change is a hot topic today. Individual beliefs in the causes, effects, and solutions to global climate change vary, but installing solar energy systems helps to reduce greenhouse gas emissions. There is another important reason you may want to add solar energy systems to your home: Solar energy can hedge your life against change and uncertainty, which global climate change and fossil-fuel use exacerbate.

Our lives are increasingly impacted by a dynamic, global political environment. Energy prices are fluctuating and generally expected to rise. Data over the past several years shows that utility prices have risen faster than the consumer price index. Energy price inflation is not only felt at the gas pump, but also in electric, natural gas, and other fuel rates. Tax and trade systems are responding to a variety of social, energy, and environmental issues. It is a period of unprecedented change and uncertainty.

Solar energy systems work by “fixing” your cost of energy. It is an investment guaranteed to provide many years of energy, without feeling the full effects and impacts from the global energy market. By dividing the cost of a solar system by its lifetime energy production, you get the “levelized cost of energy.” For example, a \$20,000 system that produces 133,000 kWh over its life equates to about \$0.15 per kWh. Compare this to what you think the cost of electricity may be in 5, 10, or 15 years. With solar energy systems you can minimize the uncertainty of utility price escalations.



### Mature Technology

Solar technology is based upon mature technology products backed by large corporations offering multi-year warranties (typically 25 years for PV). Solar equipment is increasingly considered a “commodity” in today’s marketplace. There are many manufacturers in which to choose in a competitive environment, where customer demand often prevails. Prices have dropped sharply over the past couple of decades, and have now more or less leveled off. In 2006 there was actually an increase in the price of solar equipment, largely due to demand outstripping supply, worldwide. As new equipment manufacturing capacity continues to come online, and solar equipment sales continue to increase, the prices are expected to drop. But for all practical purposes, now is as good a time as any to make a solar equipment investment, especially when one considers the tax and purchase incentives available.

### Easy Installation And Trouble-Free Operation

Determining the cost and benefits of solar energy is relatively easy, as is the design and installation process. Once installed, you should find your solar system provides years of reliable service with very little need for maintenance.

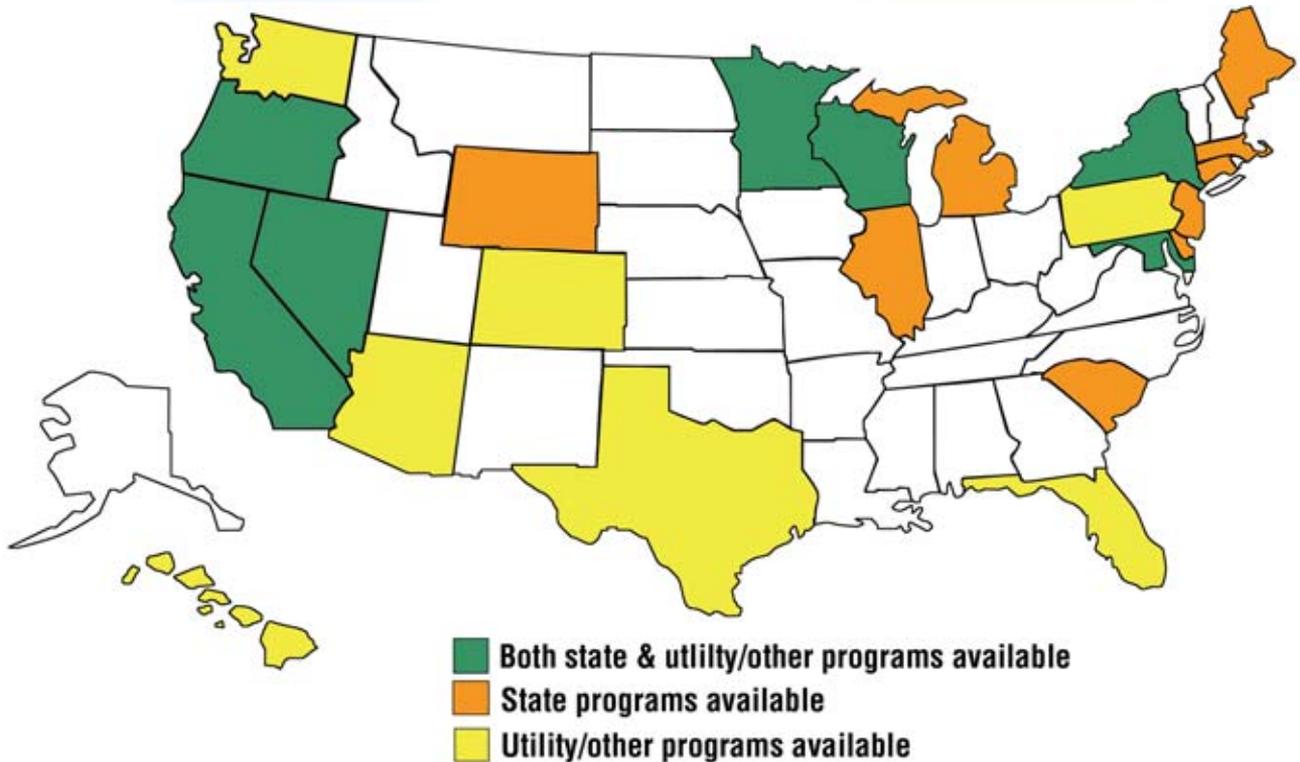
Pre-Solar Bill (Month)	Net Cost	Equity Increase	% Return
\$102	\$20k	\$20k	103%
\$209	\$39k	\$57k	145%
\$379	\$58k	\$102k	176%

#### Other Home Improvements

Deck Addition	\$6.3k	\$6.7k	104%
Bath Remodel	\$10.1k	\$9.1k	89%
Window Replacement	\$9.6k	\$8.2k	85%
Kitchen Remodel	\$44k	\$33k	75%

MY SOLAR  
ESTIMATOR

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### Explore With Free Web Tools: [www.findsolar.com](http://www.findsolar.com)

New Web-based tools available today allow you to easily determine the cost and benefits of installing a solar energy system. Perhaps one of the most comprehensive, free Web tools available is [www.Findsolar.com](http://www.Findsolar.com). It is easy to use and gives you a powerful tool to help evaluate a solar energy system for your home. Estimators for solar electric systems, solar domestic hot water (SDHW), and solar pool and spa heating are available. This Web site also offers a database of about 1,000 solar professionals across the United States. You can match your interests to these Solar Pros and send them e-mail inquiries directly through [Findsolar.com](http://Findsolar.com). Extensive profiles are available, including customer ratings and reviews of each Solar Pro. This is a free public service made possible by the American Solar Energy Society ([www.ases.org](http://www.ases.org)).

Today there are many tax and other financial incentives available to help reduce installation costs. There are Federal tax credits available, and other incentives vary by state and local. The incentive terms also differ by consumer type—residential, commercial, nonprofit applications. And new financial

instruments are beginning to become offered, which can provide future earning power: “Renewable Energy Certificates” (RECs, sometimes called “GreenTags”) are certificates that document the carbon you’ve saved (greenhouse gases). New markets are starting to open up, which allow RECs to be traded, like stocks and other equity instruments. As REC trading comes online, you will have another financial advantage as a solar homeowner.

[Findsolar.com](http://Findsolar.com) includes a summary of incentives available in your area and links to other resources to help you learn and explore in more detail.

### What To Expect

Other home improvements, such as a bath or kitchen remodel, can be highly disruptive to your home and life. But the work involved with installing a solar energy system is accomplished largely on the outside of your home and is significantly less disruptive. There is usually no need to move furniture, curtain off areas, or deal with dust and debris inside your home. Most systems can be installed and commissioned in less than a week, and often in just a couple of days.

Financing your system can be done with home equity lines of credit or other similar, standard, loan instruments. And at least one company now offers loans specific to solar energy systems ([www.cleanpowerfinance.com](http://www.cleanpowerfinance.com)).

A large number of solar energy systems have been installed over the past few years, and building permit departments are usually experienced and rather streamlined in their permitting process. The paperwork required to receive your tax credits and incentives can be somewhat more complex. And if you are installing a PV system, a “net-metering” agreement may be required. This is an agreement you make with your utility company that allows you to “sell” your solar energy back (“spin the meter backwards”). Most Solar Professionals will handle the building permit, financial incentive, utility agreements, and other paperwork for you. All you'll need to do is sign the forms so they can be submitted and processed. Tax credits and deductions are rather straightforward and can be processed with tax software or by your tax preparer.

Once your solar installation is complete, there is very little maintenance or operating expense. You'll be reminded of

your new solar system when you come home after work, and see it glimmer in the sun. You'll be reminded of it when you get your new, lower energy bill. You'll be reminded of it when the power utility has blackouts and only your home remains powered. And you'll be reminded of your solar system when neighbors and friends stop by to have a look and learn from you.

Perhaps, once or twice a year you may want to clean off your solar panels to keep them top producers. This can easily be done when you maintain gutters or perform other regular seasonal roof-related work.

You'll love living in your new solar-powered home. And if you do decide to sell your solar home, you should realize the asset value of your solar system. **UHD**

#### The Author

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