

Solar Power FAQ's (Frequently Asked Questions)

What is solar energy?

Solar energy takes advantage of the sun's rays to generate heat or electricity. It is an infinitely renewable resource and unique for its ability to generate energy in a quiet, clean, and consistent manner. Can't beat the sun for being oh-so-cool!

How do solar photovoltaic cells work?

In layperson terms, photovoltaic cells are comprised of a semiconductor material such as silicon. Added to the silicon are the elements phosphorous and boron which create conductivity within the cell and activate the movement of electrons. The electrons move across the cell when activated by the sunlight's energy into the electrical circuit hooked up to the solar panel.

For more information, visit our Photovoltaic Electric Systems page.

What is the difference between solar panels versus building integrated photovoltaic products?

Solar panels are flat panels of photovoltaic arrays mounted on a roof or a pole to capture the sun's rays. Building integrated photovoltaic materials are PV arrays that are integrated into the building material itself, primarily windows, roof tiles, or walls. Solar panels work well for retrofits or remodels while BIPV are appropriate for new construction or a major renovation.

How much does a solar electric power system cost?

A 2kW solar electric system will cost approximately \$20,000. That total includes the cost for all components – solar panels, panel mounts, and inverter – and labor associated with installation. It does not however, reflect all the avoided costs, such as the tax breaks and the credits received through net metering.

Go to our Solar Power Cost page for more information, visit our Solar Calculator page to get an estimate, or contact us – Highlight Solar to size and price the right system for you.

How much will I really save on my utility bills from a home electric solar power system?

Of course this is a relative question. It depends, in part, on how much electricity you use and how efficient the appliances are that you operate. That said expect to generate excess electricity in the summer (when days are long) which can potentially offset the energy you use from the grid in the winter. A combination of energy efficient appliances and light bulbs can help reduce your homes energy bill by over two-thirds.

Find out more about the costs and potential savings from a residential solar power system in our Solar Power Cost section.

What's the difference between solar photovoltaic and solar hot water systems?

While both types of solar systems capture energy from the sun, solar photovoltaic systems use photovoltaic panels to produce electricity. Solar hot water, or thermal, systems capture sunlight to heat water for domestic use, to heat a swimming pool, or for a radiant heating system.

What are solar hot water systems?

Solar hot water systems, broadly termed solar thermal systems, use the sun's energy to heat water. Solar hot water systems can be used to heat a hot water tank or to warm a home's radiant heating system. Swimming pools and hot tubs use a modified solar hot water system for heating water.

How do pool heating systems work?

Pool heating systems use a modified solar hot water system to capture the sun's rays to heat your pool or hot tub.

Can I use solar power to heat my home?

Absolutely! Radiant heating applies solar thermal technology. Transferring solar energy through pipes into an under floor radiant heating system is a wonderful way to stay warm. Radiant floor systems are typically 40 percent more efficient than their forced air counterpart and can be zoned to match thermal comfort to each room.

How much maintenance do solar energy panels require?

Solar photovoltaic panels require little maintenance – no need to wash or dust. It is, however, important to place panels where they will remain clear of shade and debris. Thus you will have to wipe them off if too much snow or leaves fall on them.

Solar hot water collection arrays don't need much attention either. It does help to periodically use a window wash brush, biodegradable soap, and water to clean the tubes.

Can I use a financing system?

Yes. Consider using a home equity loan for the purchase and installation costs of a solar photovoltaic or solar hot water system to take full advantage of federal tax deductions. Solar energy systems are viewed as a major home energy savings upgrade and there are financial tools out there that reward you for your efforts. Remember, installing a solar energy system is comparable to any other upgrade you might do to your home, such as installing a new deck or remodeling a kitchen.

Find more information about ways to finance your home's solar power system in our Solar Financing Options section.

Do I need special insurance requirements?

Standard homeowner's insurance policies usually suffice to meet electric utility requirements. Electric utilities usually require that homeowners who take advantage of net metering sign an interconnection agreement.

Will I need a building permit to install a solar energy system in my home?

Yes. You'll need to obtain building permits to install a solar photovoltaic or solar hot water system. Similarly, building, electrical, and plumbing codes also apply. That said, residential solar power systems do not use "radical" building techniques and most jurisdictions have building codes that fully embrace solar energy technology. Highlight Solar will roll the price for permits into their cost estimate.

What if I'm the first person I know to install a photovoltaic system on my home?

First off, congratulations! Secondly, there are plenty of resources out there. Most solar electric building standards are based on the National Electric Code (NEC) Article 690. If you happen to be one of the first in your area to install a solar PV system, you can work with Highlight Solar and local building officials to successfully install your photovoltaic system. NEC Article 690 spells out the requirements for designing a safe, reliable, and code-compliant system.

When should I seek a solar professional?

Although solar energy systems work in parallel with conventional residential electrical and plumbing systems, there are quirks in the process well suited to seeking out professionals who specialize in solar power installation. Highlight Solar can help you determine the type and size of system most suited for your needs.

What should I ask a solar professional installer?

Highlight Solar installers can take the guess work out of installing a solar power system. Whether you are considering solar photovoltaic, solar hot water, or solar heat for your pool, we can help you determine the type and size of system that will work best and guide you through the process.

Why is it important to get multiple bids?

As with any major purchase, it's helpful to compare costs and information. Seeking information from multiple professionals can provide constructive advice, set realistic expectations, and help you fine-tune the design that will work best for your application. Highlight Solar is the best full service solar electric service provider.

How can I calculate the cost and payback time from a solar power installation?

You can estimate how much a solar electric or solar hot water system may cost if you determine your current energy needs and costs and compare against your future anticipated use. Once you have a sense of how much energy you use, you can evaluate the cost of purchasing and installing one or both of the technologies.

Luckily in today's market you can take advantage of multiple federal, state, and local tax credits, rebates and other financial incentives that create attractive and competitive prices for solar PV and hot water systems.

Find more information in our Solar Power Cost section.

How long will it take to install a solar power system in my home?

Planning, configuring, and doing any custom ordering for your solar energy system can take up to a few weeks. However, the installation process itself can typically be completed in only a few days time, in many cases even less.

What components do I need to install a grid-tied solar electric system?

You will need a photovoltaic array to capture the sun's energy, an inverter to convert the direct current (DC) produced from the photovoltaic cells into alternating current (AC) used by your home, and a house utility meter – called a net meter – that can record both the electricity produced from your home's power system as well as any power you may use off the grid. These three system components are then connected through a series of wiring. The photovoltaic panels are secured to your roof with panel mounts or are installed on poles that can be adjusted for sun angle.

What is a net meter?

Net meters look very much like other outdoor meters with one notable exception – they spin both forwards and backwards recording both the power produced and power used.

Do I need battery backup for my solar panels?

Probably not – a backup battery bank can add as much as 25% in cost to a residential solar PV system. It's not necessarily more efficient either – a same sized solar array will yield about 7–10% less energy if it's battery-tied than its grid-tied counterpart.

Though you will remain tethered to your local utilities' grid, you will not have to worry about not generating enough power. You also gain the advantage of offsetting rising utility costs. Most solar photovoltaic experts do not recommend adding a backup battery system unless there is concern about a long utility outage or the residence is in a remote location.

How much space do I need for a solar photovoltaic system?

In bright sunlight, a square foot of a conventional photovoltaic panel will yield 10 watts of power. That's a helpful rule of thumb for calculating a rough estimate of how much area you might need. For example, a 1000 watt system may need 100 – 200 square feet of area, depending on the type of PV module used.

How many solar panels do I need for an electric solar power system?

The size of the photovoltaic system is correlated to your home's energy-use needs, available space for a system, and overall costs for the system components and installation. Solar contractors in your area can help determine the best size for your solar photovoltaic system.

Find out how to estimate your home's solar electricity needs by checking out our Solar Power Cost section.

How much shading is too much for solar photovoltaic panels?

Unfortunately shading a photovoltaic system dramatically decreases its output. Just shading the bottom row of wafers alone amounts to an 80% reduction in efficiency. So above all, don't shade your array!

How do I know if solar panels will work on my home?

Take a look at the position of your home on its lot – and particularly your roof. Ask the following questions:

1. **Is there good southern exposure?** Orienting solar panels to the south maximizes the effectiveness of energy collection.
2. **Is the exposure free of trees or buildings that could shade the panels or drop debris on them?** Shading photovoltaic panels dramatically reduces their effectiveness.
3. **What is the pitch of your roof?** Most roofs, from flat to 60-degrees can accommodate photovoltaic panels.

Do I need to have south facing exposure to have a solar energy system?

Although southern exposure increases the effectiveness of a residential solar power system, your home may still work for solar power without having south facing exposure. Seek advice from a professional solar designer or installer to ensure success.

What other factors are important to consider when installing a home solar energy system?

The location of your home and the local climate will play into where you place and how you install your solar electric or solar hot water system. Wind speeds, heavy snow loads, and salt water can all affect a solar array. Understanding how those inputs effect performance will determine the types of mounts or how the arrays are angled. Highlight Solar is quite knowledgeable about your local conditions and can help you design what works well for you.

<http://www.highlightsolar.com> - Your best source for solar electric energy!!