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How do solar panels work at night and on cloudy days?

Reading Time: 4 minutes

If you've been wondering "do solar panels work at night?", you're certainly not alone. If you choose to rely on solar panels for your home electricity use, it's important to understand how solar panels can be a reliable source of power during night time when there is no available sunlight.

There's a long and a short answer to this question. We'll start with the short, and then explain how solar energy storage works. We'll also discuss how much solar electricity production you can expect on cloudy days.

Solar panels at night: key takeaways

- Solar panels don't produce electricity at night when the sun isn't shining
- [Net metering](#) and [solar batteries](#) allow you to use excess electricity produced during the day at night
- Start comparing solar quotes on the [EnergySage Marketplace](#) for maximum savings

Do solar panels work at night?

Solar panels require sunlight to generate electricity for your home so they do not work in darkness. Thus – the simple answer to this question is no. The confusion around solar working at night is often due to the concept of solar storage, which allows homes to still have energy supply at night.

The purpose of a solar panel system is to absorb sunlight, also known as photovoltaic energy (PV), and convert it to direct current (DC) power. The DC power is sent through the system's inverter to be converted to alternating current (AC) power, which is the type of power that most households run on. At that point, your solar array can feed electricity into your home. If it is producing more electricity than you need, the excess is fed back into the electric grid.

Since solar panels can only produce power during the day, the question then becomes "how will solar panels provide power overnight when there is no sunshine?" There are two primary solutions that help to resolve that problem. Net metering and solar-plus-storage technology allow your solar panel system to access electricity overnight when solar panel production is dormant, either through connection to the electric grid or to a battery. Thanks to grid connections and solar battery storage, solar panels are a sustainable round-the-clock energy solution.

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How solar storage and net metering make solar sustainable during nighttime

One of the biggest reasons that home solar panel systems are a good investment is [net metering](#). Here's a simple way to understand what net metering does: when your solar panels produce excess power, they feed energy back to the grid. The utility then compensates you for the excess grid supply with credits that are added to your electric bill. In a sense, your system's excess production can earn you money.

Net metering also means that your home maintains a connection to the grid even after you install the solar panels. This grid connection ensures that you still have power regardless of daily or seasonal variations in solar panel production levels. Your panels might produce more electricity than you need during the day (especially during the balmy summer months). However, they will not produce at night when sunlight isn't available – that's when you draw on the credits you've earned from sending excess electricity back to the grid. Ideally, the credits from your panels' surplus production will cover you during the times when you need to draw electricity from the grid. In this case, the grid is serving as a form of energy storage.

The only downside to net metering is that it's not available everywhere in the U.S., which means that there is a need for other nighttime power supply options. Before the invention of the grid-tied inverters that allow net metering to occur today, all solar panel systems were hosted off-grid. The owner of the system had to generate all of their power on their own and store excess with the help of robust battery banks. At that time, solar storage options were expensive and the combination made solar a high ticket option.

However, the solar storage market is heating up. Now, many U.S. homeowners view batteries as the best option for energy storage for night use. If you have sizable power usage, or your utility doesn't offer net metering, you should consider asking your solar installer to include a solar battery in his or her solar quote. Our [Solar Calculator](#) can offer some insight as to what your power usage is and how much solar could save you.

Do solar panels work on cloudy days?

The simple answer is that solar panels do work on cloudy days – they just do not perform as well as they would on a bright sunny day. Though estimates range, solar panels will generate about 10 – 25% of their normal power output on a cloudy day. It would be accurate to say that solar panels do not work *as well* in rainy or cloudy weather.

It's important to mention here that, contrary to what you might expect, cloudy and rainy climates are still often popular places for solar energy installations. The most indicative factor for the popularity of solar panels is the cost of electricity, not the amount of sunlight a city sees. Many of the [top cities for solar](#) in the U.S. are not particularly sunny. Rather, they have high electric rates, with the result that homeowners reap major benefits in terms of [bill savings](#) and a quick [break-even point](#).

As an example take San Francisco, famous for the fog that hovers over the city for most of the year. And yet, San Francisco is a top-five city for solar as a result of its high cost of energy and a generally warm climate that yields soft but consistent sunlight all year long. This example helps to illustrate why sunlight alone cannot determine how effective solar will be at generating energy savings.

In some cases, clouds can actually result in better panel performance than standard sunny weather. A cloud can reflect or sometimes even magnify sunlight, which results in additional power output from your solar panels.

Key takeaways: when will solar perform the best?

Solar panels will not operate at maximum production when clouds are blocking the sun, and they will certainly not produce electricity when there is

no available sunlight during the nighttime hours. The key is to plan accordingly when considering a solar installation. Whether it's net metering, the right solar energy storage option or even [pairing an electric car with your system](#), almost anyone can find a solar energy system to power their home at the right price in today's day and age.

The next step is to find out exactly what solar will cost you and see what others are paying in your neighborhood when they go solar. To get a better feel for the real cost of solar, register your property on the [EnergySage Solar Marketplace](#) where you can receive and compare quotes from local, pre-screened installers in your area.

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Posted on **OCTOBER 28, 2018** [[HTTPS://NEWS.ENERGYSAGE.COM/SOLAR-PANELS-WORK-NIGHT-CLOUDY-DAY/](https://news.energysage.com/solar-panels-work-night-cloudy-day/)] by **LUKE RICHARDSON**.

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Tags: **NET METERING, SOLAR BATTERIES, SOLAR PANEL EFFICIENCY**

6 thoughts on "How do solar panels work at night and on cloudy days?"

Ronald Harrower

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