



Typical efficiency of solar panels

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Learn how solar panel efficiency is calculated and what factors affect it. See the most efficient solar panels in 2024 and how they compare to monocrystalline and ...

As subject matter experts, we provide only objective information. We design every article to provide you with deeply-researched, factual, useful information so that you can make informed home electrification and financial decisions. We have:

Incorporated third-party data and information from primary sources, government agencies, educational institutions, peer-reviewed research, or well-researched nonprofit organizations.

We won't charge you anything to get quotes through our marketplace. Instead, installers and other service providers pay us a small fee to participate after we vet them for reliability and suitability. To learn more, read about how we make money, our Dispute Resolution Service, and our Editorial Guidelines.

Solar technology has made leaps and bounds toward higher efficiency. Just five years ago, the average solar panel efficiency in quotes through EnergySage was 19%. In 2024, the average efficiency is about 21.4%, which translates to 10% more electricity produced per panel.

Within those averages, you'll find solar panels with a range of efficiency ratings. It might not surprise you that you'll usually pay more for solar panels with greater efficiency. SunPower, one of the better-known solar panel brands, offers the most efficient and most expensive solar panels for homes at 22.8% efficiency. Other brands like REC, Panasonic, Maxeon, Jinko Solar, and Q CELLS aren't too far off with above 22% efficiency.

We'll help you decide if the highest-efficiency solar panels are worth it for you, and offer some advice on how to keep your panels producing electricity as efficiently as possible.

A solar panel's efficiency measures its ability to convert sunlight into usable electricity. If the sun shines on a solar panel with a 20% efficiency rating, 20% of the sun's energy will convert to solar energy in ideal conditions. Given the same amount of sunlight shining simultaneously on two equal-sized solar panels with different efficiency ratings, the more efficient panel will produce more power than the less efficient panel.

Solar panels are made of up multiple silicon solar cells, which, combined, determine a panel's overall efficiency rating. The structure and type of silicon crystal (generally monocrystalline or polycrystalline), electrical configuration, and surrounding components of the solar cells all influence that number.

Today, about 95% of solar panels quoted on EnergySage are between 19.7% and 21.6% efficient.



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Higher-efficiency panels are typically more expensive, but they can be worth it depending on your energy needs and the configuration of your roof.

SunPower offers the most efficient solar panels for homes today at 22.8% efficiency. They come with the highest price tag but can be worth it if your roof has limited space or a lot of shading. Otherwise, you may be better off choosing one of the other highly efficient, but more affordable solar panels on our list.

*Prices reflect the average quoted price range of a roughly 11 kW solar panel installation, including installation costs, after accounting for the 30% federal tax credit incentive.

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