



Single family home solar panels

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One of the first questions homeowners ask when going solar is "How many solar panels do I need to power my home?"

The goal for any solar project should be 100% electricity offset and maximum savings; not necessarily to cram as many panels on a roof as possible. So, the number of panels you need to power a house varies based on three main factors:

In this article, we'll show you how to manually calculate how many panels you'll need to power your home. Once you have an estimate for the number of panels, you're one step close to figuring out how much solar costs for your home, and how much you can save on electricity bills

If you'd rather skip the math, connect with an Energy Advisor to design a custom solar system.

While it varies from home to home, the US households typically need between 10 and 20 solar panels to entirely offset their average annual electricity consumption.

The goal of most solar projects is to offset your electric bill 100%, so your solar system is sized to fit your average electricity use. Here's a basic equation you can use to get an estimate of how many solar panels you need to power your home:

Obviously, electricity use, peak sun hours, and panel wattage will be different for everyone. And since you didn't come here to do algebra, we'll go through how to figure out each variable and run through an example scenario based on national averages.

Related reading: [How Do You Calculate The Number of Panels on a 16 kW Solar System?](#)

According to the US Energy Information Administration (EIA), the average US household in 2021 used 10,632 kilowatt-hours (kWh) of electricity per year. That's equal to:

It's important to note that this usage varies quite a bit from state to state. For example, the average daily usage was ~18 kWh in Hawaii and 40 kWh in Louisiana, which is quite a spread. But we'll use the national average 30 kWh per day as the figure for our example.

The easiest way to find your daily electricity usage is to dig up some recent utility bills. Your bill should show your usage for 30 days (or whatever your payment period is) and you can use this to get a sense of your daily electricity consumption. Just take the total usage during the period, and divide it by the number of days.



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Electricity usage varies from month to month, so the more bills you can average together, the more accurate your calculation will be.

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Web: <https://www.kary.com.pl/contact-us/>

Email: energystorage2000@gmail.com

WhatsApp: 8613816583346

