12v solar panel size calculator

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To determine how many solar panels you need with our solar calculator, enter the following in their given fields:

Then click on calculate.

Say you have a solar energy system with a 12v 50Ah lithium-ion battery bank, an MPPT charge controller, and a depth of discharge of 100%. If you want your solar system to charge the batteries fully within 7 peak sun hours, your system size would be approximately 110 watts.

If you have a 12v 80Ah lead-acid battery bank with a depth of discharge of 50%. The solar system size needed to get a full charge within 8 peak sun hours when using a PWM charge controller would be approximately 130 watts.

The average peak sun hours in the United States is 5. So, in all charts, we used peak sun hours of 5.

When trying to calculate the size of the solar panels you need for your solar system, you must consider the following factors:

A battery’s depth of discharge (DOD) is a percentage indicator of how much of the total battery capacity a battery has discharged at a given time. Going by this, when a battery’s DOD is 0%, the battery is not discharged at all (fully charged). Then when the DOD is at 100%, the battery is fully discharged.

Why is your battery’s depth of discharge important when calculating solar array size? Well, with a higher level of discharge, your solar panel system will need more power to give your battery a full charge.

The battery voltage plays a part in determining how much solar power the battery needs to charge fully within peak sun hours.

For one, the solar panel voltage must at least match the battery voltage. So, since the voltage is directly proportional to power, it checks out that batteries with higher voltages need more solar power to charge within shorter peak sun hours.

Basically, the higher your battery voltage, the higher the solar array size needed.

Basically, your battery capacity affects solar array size and your preferred charging time in peak sun hours.

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