Solar battery 220 kWh

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As grid electricity gets more expensive and unreliable, homeowners are using solar and battery systems to reduce their energy costs and keep the lights on when the grid goes down.

But while sizing a solar system is pretty straightforward, choosing a battery size takes a bit of nuance and largely depends on how you plan on using it. In this article, we"ll explore the nuances of sizing a solar battery and lay out a process for determining the ideal battery size for your needs.

For example, the SunPower SunVault 13 has a nameplate capacity of 13 kWh, but a usable capacity of 12 kWh after factoring in that only 92% of its full capacity can be discharged without affecting its lifespan. So, when choosing a battery size, make sure to focus on the usable capacity.

The first step to sizing your solar battery is determining which function(s) you would like it to perform. There are three basic roles battery storage can play:

Historically, home battery systems are most associated with critical loads backup. However, with time-of-use rates becoming more common and net metering policies eroding across the US, using battery storage for solar self-consumption is gaining popularity as a cost-saving strategy.

There may be cases in which you can use a single battery system for two purposes. For example, if you have a 10 kWh backup battery you may also be able to use it for solar self-consumption (with the understanding that you won"t get much or any backup power if the grid goes down shortly after your battery has been discharged).

Air conditioning and electric heat consume a ton of electricity and therefore typically aren"t included in essential battery backup systems. But smaller systems, like the ones listed above, are routinely backed up by home solar and battery.

Next, you"ll make a "loads list" that adds up how much electricity each system uses. This will start to give you an idea of how much capacity you"ll need to power these systems on battery power alone.

The final step is to determine how long you want to be able to power these systems with battery storage alone - known as "days of autonomy." Ideally, your solar panels will charge your battery during the day, but it may be worth planning for scenarios in which snow, cloudy weather, and short winter days limit your solar production.

For what it"s worth, the average utility customer in 2021 experienced 1.42 power outage events per year that lasted more than 7 hours on average (up from 3.5 hours per outage in 2013), according to data from the EIA.

But there have been 28 outages that lasted 10 hours or more in the first 9 months of 2023 alone.

Choosing a battery size is more of an art than a science because it requires a balancing act between your goals, critical electricity needs, and budget. As a rule of thumb, 10 kWh of battery storage paired with a solar system sized to 100% of the home"s annual electricity consumption can power essential electricity systems for three days.

You can get a sense of how much battery capacity you need by establishing goals, calculating your load size, and multiplying it by your desired days of autonomy.

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