

SENSIBLE SOLAR AZ™

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Solar Battery Buying Guide

Expert Installers of the Tesla™ Powerwall 3

Here's All You Need to Know Before Making Your Purchase

Adding solar batteries to your solar panel system will keep your home powered with excess solar energy storage. Here's everything you need to know to pick the right batteries.



Andrew Francis Wallace/Getty Images

With electricity costs rising, solar panels are an excellent way to capture free, clean energy from the sun. A recent CNET survey found that 78% of surveyed US adults are concerned about rising home energy bills, and 70% of US adults are taking steps toward energy efficiency. If you're thinking along the same lines, it might be time to get a solar installation. Solar power with a tie-in to the grid can help lower solar bills and offset costs when the sunshine in your area isn't at its peak. Attaching a solar battery bank gives you real energy independence

Without solar batteries, even a house covered in photovoltaic panels will leave homeowners literally powerless when the grid goes down.

"Something that people don't consider is that if they're on natural gas and the power goes out in the winter, they think their heater is going to work, but most have an electric fan, so if the power goes out you still need something," said Mike Murphy, owner of Utah-based PrepSOS, which sells solar batteries, generators and other emergency-preparedness equipment.

Batteries really tie a solar power system together, ensuring your home has power from the sun, even when the sun isn't around. They keep your home powered and make sure the important electronics, medical equipment, air, and computer systems continue functioning. In an area that has a net metering policy (such as Arizona), you can save even more money by sending excess energy generated by your solar energy system back to the grid at times when it's more valuable.

Can solar batteries save you money?

Understanding the impact solar can have on your home

All these benefits come at a cost, of course, and there is a decision you need to make while choosing a solar battery. We've put together to help you wade through specifications to find the right match for your needs.

How solar batteries work

The simplest way to think of batteries is to imagine that the electricity in your house flows through wires in much the same way as water through plumbing. Batteries fill the role of a storage tank, making electricity readily available when it's needed, just as indoor pressure tanks and water heaters do with water.

When batteries are tapped for energy, their reserve of stored electricity is depleted, but in a properly wired system, they can be automatically replenished by "catching" any excess electricity flowing through the system from sources like solar panels or the grid.

Depending on your goals for installing batteries, your system might look a bit different.

1. Connect just to solar panels: Batteries connected only to solar panels will fill when the sun shines and will discharge when you use electricity and the sun is down or behind clouds. It's one option if you are off-grid and away from electrical utilities.

2. Connect to solar panels and to the grid: If you have a solar inverter that can temporarily disconnect you from the grid, you have what's known as a hybrid solar system. In such a system, you can charge your battery with your solar panels or the grid and use the energy stored there in your home or send it back to the grid and save some money via rate arbitrage (if you have time-of-use rates).

3. Connect just to the grid: We wouldn't call them solar batteries you can install batteries without solar panels at all. They would charge from the grid and would be useful for backup power or for enrolling in a virtual power plant.

Pros and cons of solar batteries

The pros and cons of buying a battery largely boil down to savings (and backup power) versus cost. The extra solar electricity you store in your solar batteries can be used in place of electricity you'd normally have to buy from your utility, or sold back to the grid when it's most valuable.

This can save you some money and relieve some pressure on the grid when there's peak demand. (Whether this is a viable money-saving option for you depends on your utility's net metering rules.)

In addition, you'll be able to use your battery bank in the event that the grid goes down due to a failure, natural disaster or even a solar flare. A backup generator can also help keep the power on in an emergency (and charge your batteries), but it requires burning fossil fuels, usually either gas or propane. Batteries do add expense to your home energy system, but federal tax credits and other incentive programs usually can be applied to the cost of storage.

Buying a backup battery system

Adding batteries is an expense for any system, but the good news is that nearly a third will come back to you in the form of the 30% federal renewable energy tax credit. Other incentives may also be available from state and local governments, utilities, and even credit unions.

Powerwall is a rechargeable home battery system

It is designed to maximize your home's energy independence. That means seamless backup and a smaller carbon footprint for your home, and potentially savings on your electricity bill.

Powerwall 3 is an intelligent system that can be customized to your energy needs, with the ability to charge from solar so energy is always available on demand.

Seamless Backup When the grid goes down, solar energy will continue to power your home and charge your Powerwall. With Storm Watch enabled, Powerwall3 communicates with the National Weather Service and prioritizes charging in anticipation of severe weather. In the event changing status due to severe weather you receive a push notification from the Tesla app.

Self-Powered Home At night, Powerwall provides you with clean energy that you've generated from solar during the day.

Time-Based Control If your utility offers Time-of-Use rates, you can use less expensive solar energy you've already generated to avoid electrical charges during expensive rate periods.

Monitoring Each Powerwall installation includes a complete energy monitoring solution for your home. You can see how your home both produces and uses energy at any given time.

Tesla Powerwall 3 Features and Specifications

Power Output The Tesla Powerwall 3 specifications offer a major power upgrade, with a maximum continuous discharge of 11.04 kW—more than double the 5 kW capacity of the Powerwall 2. This 120% increase allows the Powerwall 3 to handle high-energy appliances like air conditioners and heat pumps, making it highly effective during power outages.

Storage Capacity The Tesla Powerwall 3 offers 13.5 kWh of storage capacity. If your household uses 20-25 kWh per day, a single Powerwall 3 can deliver 6 to 8 hours of power during an outage. Actual battery backup system duration depends on your specific energy usage and consumption habits.

Integrated Solar Inverter One of the most notable features of the Powerwall 3 is the inclusion of a built-in solar inverter, capable of supporting up to 20 kW of DC solar input.

Round Trip Efficiency The Powerwall 3 offers a Solar to Home/Grid efficiency of 97.5%. If power is going via the battery (Solar to Battery to Home/Grid) the efficiency rating is 89%. These figures are comparable with many of the leading battery options on the market.

Installation and Expandability Tesla has introduced design improvements to make installation faster and more cost-effective, including a built-in DC isolator and reusable packaging. Additionally, Tesla plans to launch "Powerwall 3 Energy Expansions" in early 2025.

Battery Chemistry Tesla has confirmed that the Powerwall 3 uses Lithium Ferro Phosphate (LFP) chemistry, moving away from the Lithium Nickel Manganese Cobalt Oxide (NMC) used in the Powerwall 2. This change enhances safety, durability, and environmental sustainability by eliminating cobalt, a toxic and expensive component. However, LFP batteries typically have a lower energy density compared to NMC batteries. The LFP chemistry has been widely adopted as the leading option for most solar battery manufacturers on the market.

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