A HOMEOWNER'S GUIDE TO
SOLAR + TESLA POWERWALL

MAINE SOLAR SOLUTIONS

Maine's local solar electric installer since 2012

To help you decide whether solar + Tesla Powerwall battery backup is the right option for you, we've put together this guide to answer the most commonly asked questions we receive.

TESLA

CERTIFIED INSTALLER

SOLAR | POWERWALL

MAINE SOLAR SOLUTIONS

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WHY BATTERY BACKUP?

Grid-tied solar electric systems do not require batteries to work. Thanks to net metering policy, you can get the full value of the electricity your system produces without relying on batteries. However, it is important to understand that a grid-tied solar electric system will not provide backup power during a power outage. Like a generator, battery backups can get your critical loads up and running without relying on the grid. This is why solar battery backups have become so popular, especially the Tesla Powerwall.

WE'RE HERE TO HELP

Whether you experience frequent grid outages, are looking for greater energy independence, or are hoping to maximize savings from your solar system, we can help find a solution that's right for you. But before we get started with customizing your battery + solar options, take a stroll through our Guide to Tesla Powerwall to answer your Tesla battery storage questions and get a feel for whether a Powerwall might be the right product for you. As you browse the guide, please do not hesitate to reach out to our team if more questions arise.

WHY WOULD I WANT A TESLA POWERWALL WITH MY GRID-TIED SOLAR ELECTRIC SYSTEM?

To fully understand why you need a battery to operate during a grid outage, it is important to understand the fundamentals of how a grid-tied solar system works. Sunlight hits the panels, generates electricity, passes through the inverter, and power electrical appliances in your home. When your solar panels produce more electricity than you're using, the extra electricity is pushed onto the electric grid so you can get net-metering credits to use later.

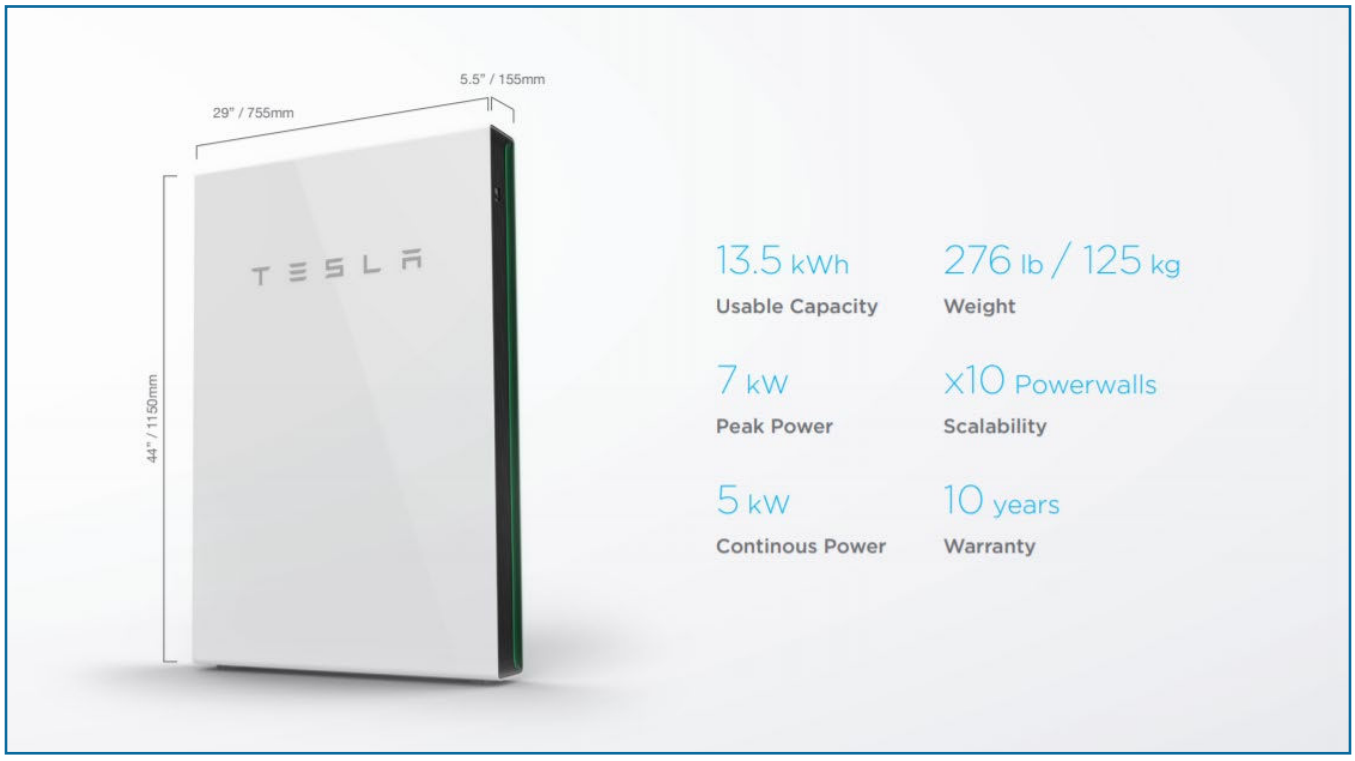
If the electric grid goes down due to a storm, for example, and your solar electric system pushes that extra electricity onto the grid, that could cause a big problem. When utility crews work on lines to restore power to the grid after an outage, they count on those lines not being energized. If your system pushes power onto the grid, it could cause serious harm to the workers. To protect utility workers, the National Electric Code (NEC) requires solar electric systems to shut down until the grid power is restored.

WHAT IS THE TESLA POWERWALL?

The Tesla Powerwall is a 13.5 kWh rechargeable lithium-ion battery primarily intended for home storage and is commonly paired with solar panels. Like any other battery storage option, a Tesla Powerwall captures and holds the energy to provide backup power in the event of an outage and can help you achieve a more independent energy lifestyle and peace of mind.

WHAT ARE THE BENEFITS OF TESLA POWERWALL?

Its capacity to support larger loads makes the Tesla Powerwall different from other battery storage options currently on the market. That means you have the freedom to power up more of what you need. The Powerwall in Maine is primarily used for short-term backup power. The Powerwall can also be used for self-consumption and Time-of-use (TOU). TOU measures and charges a utility customer's energy consumption based on when the energy is used but varies by region and utility. It also has a user-friendly customer interface and an excellent dollar per kWh value.



HOW DOES A TESLA POWERWALL BATTERY WORK?

The Tesla Powerwall connects to the electrical system in your home and has a stored energy bank that can power your loads. On its own, a Powerwall will automatically keep your home operating when the power goes out. When combined with a solar array, the Powerwall can be recharged during an extended power outage. It can also be used for "Self-Consumption" which means storing power from your solar array during the day and then using battery power at night without drawing any energy from the utility.

WHERE DOES THE TESLA POWERWALL GET INSTALLED?

At 45.3 inches tall, 29.6 inches wide, and 5.75 inches deep, the Tesla Powerwall's compact profile combined with floor and wall mount options means you don't have to sacrifice a ton of space for battery storage.

Powerwall is built to withstand a wide range of temperatures, humidity, rain, and sun. Though they can be installed indoors or outdoors, extreme temperatures make them operate less efficiently. Tesla Powerwalls in Maine are installed in conditioned spaces to protect the battery from the elements due to our hot summers and cold and snowy winters. Powerwall must be installed in non-living spaces – like a garage, basement, or mechanical room. Your solar consultant can talk you through the details and options on where to place your Powerwall.

CAN I INSTALL A POWERWALL IF I DON'T HAVE SOLAR PV?

Though a Tesla Powerwall installed without solar can charge from the grid, there is not as much benefit to having battery storage if it's not connected to a solar electric system in Maine. Unlike areas with high variation in on-peak and off-peak rates (think California), it isn't as financially rewarding here.

Without solar, the Powerwall has no way to recharge during an extended outage. So a Powerwall may help with short, temporary power outages, but once the battery is depleted, you must wait until utility power is restored. **A grid-tied Powerwall cannot be configured to charge from a generator source.**

The best solution is to include a solar electric system with your battery purchase. This does add cost to the system's price, but batteries are currently eligible for the Federal Solar Investment Tax Credit[1].

CAN I INSTALL A TESLA POWERWALL IF I ALREADY HAVE SOLAR?

Yes, in most circumstances, you can. A Powerwall can retrofit most existing home solar systems. Your current inverter and layout will determine the size and design of a battery for existing equipment. Powerwall is compatible with all kinds of solar inverters: SMA, SolarEdge, Fronius, Enphase, Delta and ABB. Powerwalls can be installed with almost all solar panel brands[2]. **However, Powerwall Systems currently cannot work with existing battery backup systems**. Contact us, and we will be able to tell you if your current solar configuration supports adding a Powerwall.

If you are thinking about going solar now but want to add a Powerwall in the future, Maine Solar Solutions will design your system to accommodate your future battery needs.

1 https://mainesolarsolutions.com/financing-rebates/federal-tax-credit/
2 https://mainesolarsolutions.com/residential-solar/types-of-solar-panels/

WHAT CAN YOU POWER WITH A TESLA POWERWALL?

How much your Tesla Powerwall system can back up and for how long depends on your home's required **power** and **energy**. **Power** is an instantaneous measurement of watts. **Energy** is a measurement of power over time. For example, a microwave may require 1200 watts of power to operate, but if you only use it for 2 minutes, that would only be .04 kWh of energy. A 100-watt ceiling fan doesn't require much power, but over 24 hours, it will need about 2.4 kWh of energy.

A single Powerwall can provide up to 5 kW of continuous backup **power**. You can back up any number of appliances so long as their combined power usage does not exceed 5 kW per Powerwall battery. A single Powerwall can provide up to 13.5 kWh of stored backup **energy**. On average, getting your critical loads down to an oil, propane, or wood heat source, lights, fridge, freezer, well pump, internet, and device charging should be about 5 kWh per day. A larger home or more occupants may require more energy. Larger appliances may require more power. Either reason would require additional Powerwall batteries. When designing your energy storage system, we must find a balance between the total capacity of the Powerwall(s) and the demand for everything you need to power.

HOW MANY TESLA POWERWALLS DO I NEED?

Most of our customers install one Powerwall that is designed to run their critical loads to start. Some of our customers plan to add more Powerwalls later on, and we design your system to be able to do that.

Remember that the size of a battery backup system is based on what electrical loads you wish to operate and how many days you want to run them before recharging the battery. Our solar consultants will provide guidance about the capabilities and cost to maximize your financial benefit while reaching your energy goals.

HOW LONG DOES A TESLA POWERWALL BATTERY LAST WHEN FULLY CHARGED?

The longevity of the battery charge depends on your home's energy use and how you manage your loads during a power outage. A Powerwall should be able to supply more than two days of lighting, refrigeration, communication, and basic home needs.

If it is sunny when you lose power and you save solar, the sun + solar will recharge your Powerwall. But we cannot make any promises that this will happen. Most outages in Maine occur in the wintertime, so if it's during a snowstorm, your solar panels might not be producing energy to keep your Powerwall charged. Energy conservation while running your home off a battery backup is essential for the best performance of any system.

CAN YOU POWER HEAT PUMPS WITH A TESLA POWERWALL?

Since most heat pumps require less than 5000 watts of power, a single Tesla Powerwall can run a heat pump; however, Maine Solar Solutions strongly suggests that you do not run your heat pump during a power outage. On a cold night, a heat pump could require over 20+ kWh of energy and will quickly deplete your battery storage, leaving you cold and in the dark until the sun comes out again. Alternatively these larger loads can also be wired so that they do not operate while the grid is down.

HOW MUCH DOES A TESLA POWERWALL COST?

Pricing includes installation labor and materials to ensure a safe code compliant installation.

	Single Tesla Powerwall	Two Tesla Powerwalls	Each Additional Powerwall
Usable Energy	13.5 kWh	27 kWh	13.5 kWh
Direct Purchase Price	$17,000	$27,000	$10,000
Value of 30% Federal Tax Credit	($5,100)	($8,100)	($3,000)
Net Cost After Tax Credit	$11,900	$18,900	$7,000

HOW MANY SOLAR PANELS DO YOU NEED TO CHARGE A POWERWALL?

Tesla Powerwalls work together with common Grid-Tied PV arrays. Even a small 3000-watt array can charge a Powerwall if the array is clear and able to make power. For this reason, we recommend primarily sizing the array to meet your net-metering needs. Each Powerwall can only accept 40 amps of solar power, so a larger array may be best paired with two or more Powerwalls. We'll determine how many solar panels and Powerwalls are right for your home based on your energy needs, budget, and goals for backup power.

CAN MY GENERATOR CHARGE A POWERWALL?

No, the Tesla Powerwall cannot be charged by a backup generator source. However, you can still use a backup generator on-site to power loads directly until the sun charges your Powerwall again. In the morning, your Powerwall will power up a few times through the morning to check for solar power availability.

DOES A TESLA POWERWALL AUTOMATICALLY SWITCH ON WHEN THE GRID FAILS?

Your Powerwall will switch on automatically during a grid failure, and your home will automatically switch over to the batteries to run your critical loads. If the sun is shining when the grid goes down, your solar system will continue to charge the battery. A Tesla Backup Gateway is installed that acts as a disconnect for your home, to prevent sending any energy back to the grid until it is safe to do so. The system will automatically switch back when the grid is up and running again. The Gateway may occasionally switch to the backup mode when the grid power is imperfect, preventing damage to your appliances during “brown-outs.”

CAN YOU SET TESLA POWERWALL CHARGING PRIORITIES?

Various consumption modes set priorities for charging and consuming that you can access via the Powerwall app.

Backup Only: A set percentage of the energy in your **Powerwall** is saved for those rainy days when you need emergency backup power.

Self-Powered: Power your home with energy stored in your solar system after the sun sets. You can set a “reserve” of power left in the battery at all times in case the power goes out unexpectedly.

Time-Based Control: Power your home or charge the Powerwall based on a set schedule.

WHAT IS THE WAIT TIME FOR A TESLA POWERWALL?

If you've followed Tesla, you'll know that their products are in high demand, resulting in delayed supply. It is important to remember that installing a Powerwall requires design and permits, which can also take time. In most circumstances, the Powerwall will be installed with your solar system, so we will schedule those installations to happen together.

HOW LONG DOES A TESLA POWERWALL INSTALLATION TAKE?

Installing a Powerwall takes our installers and electricians about one day. In most cases, we'll be installing the battery with your solar system, which could take 1-3 days, depending on the size of your system and the complexity of the electrical work required. The power to your home will be off for approximately 4 hours during the installation.

WHAT TYPE OF WARRANTIES DOES A TESLA POWERWALL HAVE?

The Tesla Powerwall comes with a 10-year warranty (unlimited cycles) and ensures the battery will keep at least 70% of its rated storage capacity (equivalent to 9.45 kWh).

HOW OFTEN DOES MY TESLA POWERWALL NEED TO BE SERVICED?

Powerwall does not require regular maintenance or servicing. However, for your Powerwall to receive software updates, communicate with the Tesla mobile app for energy monitoring, and be alerted to upcoming power outages, you need a reliable internet or cellular connection. A Powerwall can continue to operate with its most recent settings, but it's highly recommended to be installed in a location with Internet or cellular service.

IS THE TESLA POWERWALL RECYCLABLE?

Yes. Once a Powerwall has reached the end of its life, Tesla will accept it for recycling back at the Gigafactory. You can learn more about the Tesla recycling program here[3].

WHERE ARE TESLA POWERWALLS BUILT?

Powerwalls are built in Nevada, USA, at the Tesla Gigafactory.

ARE THERE TESLA POWERWALL ALTERNATIVES?

Our team continuously evaluates the best technology to offer the most reliable and cost-effective energy storage solutions. We tailor each solar battery solution to your home or business's energy storage needs and offer a variety of battery options, including traditional lead-acid batteries and other lithium-ion alternatives. The most popular option among our grid-tied solar customers is the lithium-ion-based system Tesla Powerwall, but we also install Generac, SolarEdge StorEdge and Sol-Ark systems which can work with almost any battery technology. Maine Solar Solutions is also the preferred installer for the Ford Lightning Vehicle-To-Home systems in Maine. Our solar consultants will discuss your options during your consultation.

WHO CAN INSTALL TESLA POWERWALLS?

A company must be a Certified Tesla Powerwall Installer to purchase and install Powerwalls. Companies must adhere to strict quality, permitting, and inspection requirements to become Certified Installers. Maine Solar Solutions was one of the first Tesla Powerwall Certified Installers in Maine, and we are thrilled to be the first* Tesla Solar Panel installer[4] in the state, providing another panel option[5] for our customers.

**Though we install Tesla Solar Panels, Tesla Shingles are not available in the state of Maine, and we do not predict they will be available anytime soon.*

3 https://www.tesla.com/support/sustainability-recycling
4 https://mainesolarsolutions.com/tesla-solar-panels-maine/
5 https://mainesolarsolutions.com/residential-solar/types-of-solar-panels/

INSTALLING WITH MAINE SOLAR SOLUTIONS

Maine Solar Solutions' solar consultants and electricians can help you find the right battery backup solution for your home. We take care of everything from designing the system specifications, permitting, installation, financing options, and customer support. If you'd like to learn more about Powerwall or are ready to convert to clean energy with a battery backup system, give us a call today or book a free assessment.

REQUEST YOUR FREE QUOTE

At Maine Solar Solutions, our goal is to empower you by giving you the information you need to make an informed decision. Our solar consultants and electricians can help you find the right battery backup solution for your home. We take care of everything from designing the system specifications, permitting, installation, financing options, and customer support. If you're considering solar energy for your home or still have questions, sign up for a solar site assessment and no-obligation solar consultation. Contact us here, call us at 207.871.7191 or email us at info@mainesolarsolutions.com.

GET YOUR FREE QUOTE AT MAINESOLARSOLUTIONS.COM

MORE ABOUT US

Maine Solar Solutions was founded in 2012, and during our ten years in business, we have designed and installed over a thousand solar electric systems throughout the state of Maine. All of our work is performed by our in-house licensed electricians and trained solar installers. Our installations are code compliant, safe, and adhere to industry best practices, ensuring a long-lasting and well-performing system.

Our team's experience is also evident in our earned credentials and partnerships over the years, which demonstrates not only our commitment to customer service but ensures that you will be a satisfied customer long after the installation is complete.