



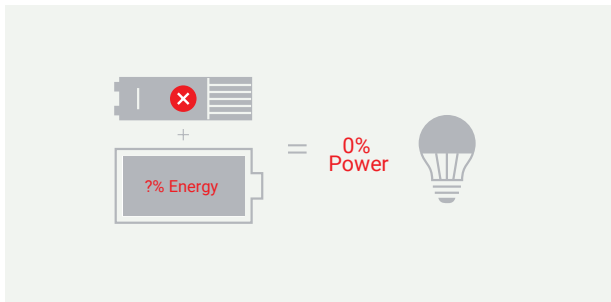
## Home Energy Storage Comparison

Enphase Storage and Tesla Powerwall

# Introduction

If you want to protect your family from blackouts, there's really just one thing you need to consider when selecting a solar and storage system... reliability. It doesn't matter how much power you have in your battery or how pretty the battery looks. When there's a power outage, your home power backup system absolutely, positively must work flawlessly.

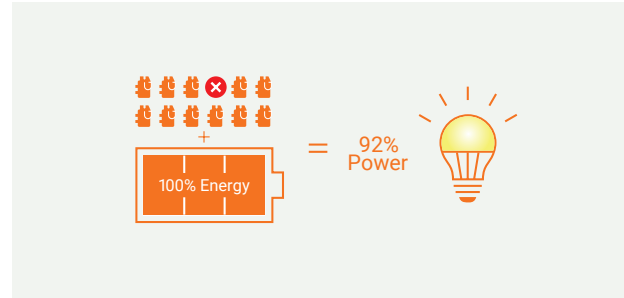
**Did you know that most solar and storage systems have a single point of failure?**



All the energy produced on the roof, and pulled out of the battery, is passed through a single string inverter. If this one inverter fails, every solar panel and battery is useless. That's a lot of responsibility riding on just one piece of the puzzle.

That's why Enphase invented distributed architecture for solar and storage.

**So, what is distributed architecture?**



Enphase is the only company in the world to place a microinverter under every solar panel and multiple microinverters in every battery. If a micro on the roof fails, your system keeps producing power. If a micro in the battery fails, you can still get energy out of the battery. It's like having a backup for your backup, and it's the best way to ensure power will be there when you need it most.

Enphase storage and Tesla Powerwall are very similar in most other ways. They're both modular. They can both detect severe weather. Both systems can provide power backup to your entire home, or just critical loads. But only Enphase has distributed architecture, and that's really the most important thing.

On the following pages, we compare the key differences between Enphase storage and the Tesla Powerwall. Beyond reliability, Enphase excels across safety, modularity, and ease of use to provide seamless and automatic backup power for your home.

**Ready for the reliability of Enphase solar and storage?**

Design your system today or find an Enphase installer near you.











# Reliability

	Enphase	Tesla
<b>Micro Technology to eliminate a single point of failure</b>	✓	✗
<b>Passive Cooling</b>	✓ Designed to cool passively, without any mechanical pieces to maintain over time	✗ <ul style="list-style-type: none"> <li>• More parts for liquid cooling system represent added points of failure and ongoing maintenance</li> <li>• If liquid cooling fails, thermal runaway occurs</li> <li>• Fans can also create noise and vibrations in the system</li> </ul>
<b>Solar commitment</b>	<ul style="list-style-type: none"> <li>• Solar installed on more than 1 million homes worldwide</li> <li>• 8th generation of solar microinverter technology</li> <li>• Loyal network of Enphase Installer Network partners, experts and enthusiasts</li> </ul>	<ul style="list-style-type: none"> <li>• Relies on industry partnerships for whole home solar and storage</li> <li>• Company lacks sole focus on solar and storage</li> </ul>
<b>Inverter expertise</b>	✓ <ul style="list-style-type: none"> <li>• Over 28 million Enphase microinverters installed</li> <li>• 10+ years of experience designing solar inverter technologies</li> </ul>	✗ <ul style="list-style-type: none"> <li>• No direct focus on solar inverter manufacturing.</li> <li>• Relies on third-parties for inverter technology</li> </ul>
<b>Storage expertise</b>	✓ Storage installed on more than 30,000 homes worldwide; 3rd generation of storage	✓ Storage installed on at least 100,000 homes worldwide; 2nd generation of storage
<b>All-in-one support</b>	✓ Designed, manufactured, and supported by a single company	✗ Solar plus storage designed by assembling varied components from separate manufacturers
<b>FEMA recommended</b>	✓ FEMA recommends microinverters as they are more reliable	✗
<b>Ease of serviceability</b>	✓ Encharge is easily opened and internal components can be swapped on-site by a certified installer	✗ Entire unit must be removed or swapped for common issues or maintenance
<b>Warranty</b>	25 year solar microinverter warranty 10 year battery warranty	10 year solar inverter warranty 10 year battery warranty









# Safety

	Enphase	Tesla
<b>Safest battery chemistry for residential use</b>	 Cobalt-free lithium iron phosphate (LFP) battery chemistry making thermal runaway <sup>1</sup> impossible	 Nickel-manganese-cobalt (NMC) battery chemistry is prone to thermal runaway <sup>1</sup> if punctured or cooling system fails
<b>Solar voltage</b>	Low-voltage AC power – just like the rest of your home	Dangerous high-voltage DC power on your roof that can cause arc fault fires
<b>UL 9540A<sup>2</sup> battery safety certification</b>	 Achieved the most rigorous testing certification for home energy storage	
<b>Lacks toxic elements for landfill safety</b>	 Cobalt-free lithium iron phosphate (LFP) battery chemistry does not contain toxic elements and is landfill safe	 Nickel-manganese-cobalt (NMC) batteries contain elements known to potentially cause acute toxicity
<b>Conflict-free chemistry</b>	 Cobalt-free chemistry avoids any global impact on abusive mining practices.	 Cobalt mining is known to have a high human cost, including in the Democratic Republic of Congo



# Modularity

	Enphase	Tesla
<b>Can add more storage later</b>	 Up to 4 Encharge 10 units can be stacked per system	 Up to 6 units can be stacked per system
<b>Varied sizing</b>	 The small storage unit, the Encharge 3, is 3.36 kWh and our largest storage unit, the Encharge 10 is 10.1 kWh	 Tesla has just one size battery with a capacity of 13.5 kWh
<b>Generator support</b>	 Use a generator within your off-grid system and even charge the battery - more flexibility when off-grid	 No generator support currently

<sup>1</sup>Thermal runaway occurs when a battery overheats, potentially causing fire or explosion

<sup>2</sup>UL 9540A battery certification is the most rigorous testing standard for home energy storage management



# Ease of use

	Enphase	Tesla
Single app to control every aspect of solar and storage, including module-level monitoring	✓	✗ Monitoring at module-level is not available
Detect severe weather and automatically prioritize battery backup	Storm Guard ✓	Storm Watch ✓
Support for power-hungry electric motor appliances like air conditioners and well pumps (inrush current)	✓ Included patented Power Start™ technology that automatically detects electric appliances as they start and throttles power in a fraction of a second so that they can start safely and reliably	✗ Powerwall relies on peak power capability and lacks an intelligent appliance throttling feature
Consistent power quality	✓ Solar and storage microinverters maintain power frequency at 60 Hz and communicate directly to curtail power as needed	✗ When battery is full and cannot accept charge, the system lowers power quality by raising power frequency to 65 Hz to curtail solar
Intelligent brown-out technology to keep your system always-on with automatic reset	✓ Enphase storage systems will automatically reset if the energy demands ever exceed available power <sup>3</sup>	✗ Requires a manual reset to bring the system back online if the demand ever exceeds the available power
Automatic time-of-use shifting that automatically uses battery backup instead of grid power when rates are high	✓	✓
Over-the-air updates	✓	✓
System sizing tool	✓ Use Enphase's online estimator tool for custom system sizing	✗ Recommended sizes without user customization options

<sup>3</sup>Enphase systems automatically reset in the case the home energy demand exceeds designed storage capacity. Powerwall will require a manual reset that could involve flipping breakers at the home circuit breaker panel.

# Summary

Enphase designed a seamlessly integrated solar and storage system to ensure reliability, safety, modularly, and ease of use for every home. Our all-in-one system is the only one on the market today that utilizes microinverters for both solar and storage to provide unique value from distributed architecture.

Moreover, we are proud to have roots in the solar industry and are committed to our mission of advancing a sustainable future for all.

## **Ready to get started with your home energy storage system?**

Enphase's System Estimator can help design the perfect system for you or find an installer near you.





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