

Powerwall & Net Billing Tariff

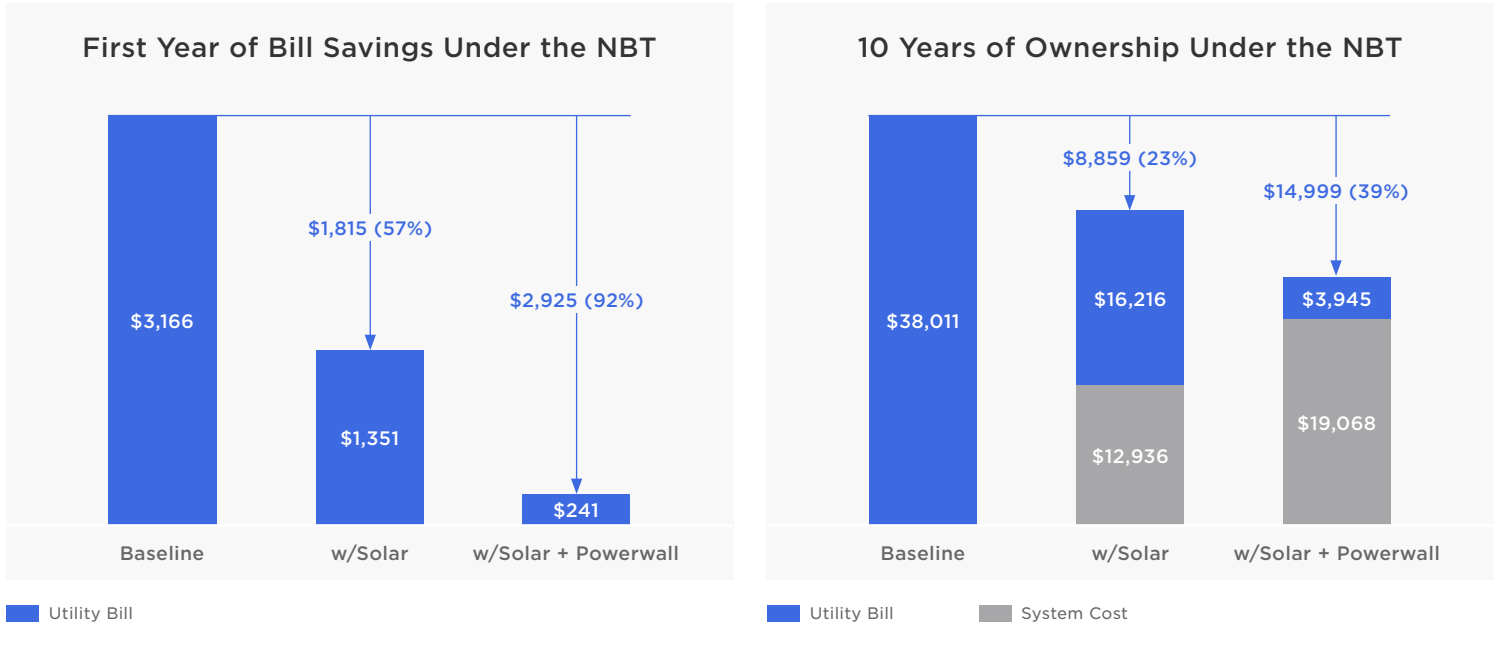


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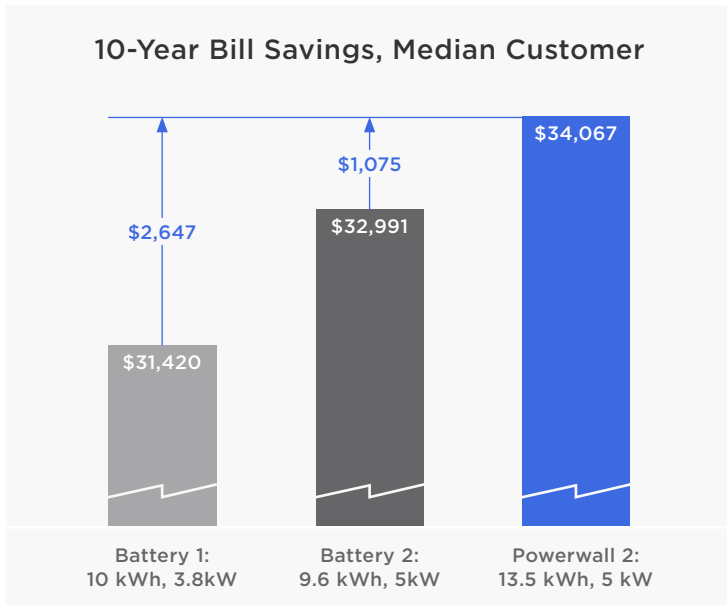
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Executive Summary

01 The new Net Billing Tariff reduces the value of energy exports to the grid. As a result, the NBT increases the value of battery storage for home energy systems.



- 02 Battery storage enables customers to:
 - A. Use more of the solar energy they produce instead of exporting it to the grid at low rates.
 - B. Take advantage of “Power Hours” when grid export prices spike, resulting in greater savings.
- 03 The energy savings gains justify the additional cost of storage.
- 04 Compared to competitors, Powerwall is the best storage solution for all home energy systems.



* Estimates are for a median customer as derived from an analysis of the Tesla fleet based on assumptions fully described herein.

Net Billing Tariff Fact Sheet

What is Net Energy Metering?

Net Energy Metering (NEM) is a policy followed by utilities to bill customers with solar systems, allowing customers to earn credits at a retail rate for the energy they export to the grid, typically as a result of excess solar generation. These credits can be applied to the accrued or future cost of energy the customer purchases from the grid. For Californians interested in installing solar, NEM created a straightforward billing protocol with favorable economics, and combined with other state policies and incentives, has helped to make the California residential solar market the largest in the U.S.

What changes under the Net Billing Tariff?

The Net Billing Tariff (NBT) is a new set of rules that dictate how customers can earn credits for their exported energy. Under NEM 1.0 and 2.0, the value of these exports was roughly the same as the imported retail price, creating a nearly 1:1 credit exchange; utilities bought energy from customers for approximately the same price that they sold it.

Under the NBT, credits for exported energy are now valued at the avoided cost to the utilities. The price that utilities will buy back energy will be much closer to the wholesale (not retail) cost of producing and distributing that energy with a traditional energy generator, such as gas, or large scale solar/wind power plants.

The price of importing energy will be set at the Time of Use (TOU) rates that utilities offer and that customers are already subscribed to; however, there are major changes to the price of exports. Export prices now vary based on the month and the specific hour your system is exporting energy to the grid. This creates an export price signal to customers that closely matches the needs of the utility grid, similar to peak and off-peak times offered with import pricing.

PG&E 2023 Weekday Export Compensation												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
01	0.052	0.056	0.048	0.047	0.050	0.049	0.051	0.054	0.053	0.050	0.054	0.051
02	0.052	0.056	0.049	0.048	0.052	0.050	0.052	0.053	0.052	0.051	0.055	0.051
03	0.051	0.056	0.051	0.047	0.051	0.051	0.050	0.053	0.051	0.050	0.054	0.049
04	0.050	0.055	0.050	0.048	0.051	0.052	0.050	0.052	0.051	0.050	0.053	0.049
05	0.051	0.056	0.051	0.049	0.056	0.050	0.051	0.053	0.051	0.050	0.054	0.049
06	0.053	0.057	0.051	0.050	0.053	0.052	0.053	0.053	0.053	0.051	0.057	0.051
07	0.056	0.058	0.053	0.040	0.038	0.052	0.053	0.054	0.053	0.052	0.058	0.056
08	0.057	0.061	0.047	0.014	0.019	0.045	0.050	0.056	0.048	0.050	0.061	0.061
09	0.055	0.050	0.028	0.008	0.006	0.037	0.049	0.054	0.039	0.042	0.049	0.055
10	0.048	0.032	0.017	0.010	0.010	0.036	0.049	0.054	0.040	0.041	0.46	0.049
11	0.046	0.027	0.018	0.007	0.012	0.037	0.050	0.054	0.039	0.041	0.042	0.045
12	0.046	0.029	0.018	0.003	0.009	0.037	0.050	0.054	0.039	0.040	0.037	0.043
13	0.044	0.028	0.018	0.001	0.008	0.038	0.050	0.056	0.039	0.040	0.038	0.043
14	0.044	0.029	0.016	-	0.008	0.085	0.054	0.061	0.041	0.040	0.039	0.044
15	0.047	0.034	0.020	-	0.009	0.139	0.067	0.120	0.053	0.090	0.042	0.047
16	0.053	0.041	0.032	0.005	0.019	0.203	0.087	0.141	0.114	0.109	0.067	0.059
17	0.060	0.062	0.055	0.023	0.039	0.224	0.235	0.332	0.136	0.153	0.064	0.063
18	0.062	0.061	0.065	0.064	0.069	0.286	0.253	0.523	2.540	0.111	0.066	0.066
19	0.065	0.063	0.075	0.072	0.074	0.251	0.248	0.749	2.869	0.107	0.068	0.067
20	0.063	0.062	0.075	0.090	0.088	0.193	0.149	0.351	0.210	0.060	0.065	0.067
21	0.062	0.062	0.065	0.067	0.075	0.084	0.098	0.284	0.088	0.058	0.063	0.065
22	0.058	0.060	0.056	0.059	0.061	0.071	0.084	0.191	0.081	0.055	0.061	0.064
23	0.056	0.058	0.051	0.056	0.057	0.057	0.055	0.061	0.061	0.053	0.059	0.057
24	0.055	0.058	0.048	0.052	0.055	0.051	0.052	0.057	0.058	0.052	0.056	0.055

Export prices are typically around \$0.05/kWh, which is much lower than legacy NEM rates. At times when demand on the electric grid is higher—such as on summer evenings—the prices for exported energy can be much higher, reflecting the high cost of providing power during those times. In the month of September, there are typically two hours a day that offer incredibly high export rates (\$2.54/kWh to \$2.87/kWh) during which customers can expect to earn a significant amount of credits if they are able to take advantage of the export rate.

Who qualifies for the NBT?

- Customers served by California Investor-Owned Utilities (IOUs) such as PG&E, SCE and SDG&E
- Customers installing a new solar or solar-plus-storage system
- Customers applying for interconnection on or after April 15, 2023

Who does not qualify for the NBT?

- Customers not served by California Investor-Owned Utilities (IOUs)
- IOU customers with an existing solar or solar-plus-storage system currently taking service under NEM 1 or NEM 2
- IOU customers adding storage to an existing solar array that is interconnected under NEM 1 or NEM 2
- IOU customers in the process of installing solar or solar-plus-storage who applied for interconnection prior to April 15, 2023

Why are utilities switching to the NBT?

While NEM was instrumental in helping scale the distributed solar industry and making rooftop solar a feasible clean energy option for homeowners and businesses, a changing electric grid and the state's ambitious climate goals necessitate a shift to a different policy.

As Californians have installed more solar systems, the electric grid has become increasingly clean in the afternoon hours when the sun is shining, allowing it to be powered by energy that costs very little to produce. At the same time, energy from the grid during the evening hours is still primarily generated by dirty and expensive fossil fuel plants. Given these changes, it makes sense for the state to move to a policy that encourages solar customers to add storage and export energy to the grid during the dirtiest, most expensive evening hours.

What will happen to the CA market as a result of NBT?

In 2022, approximately 251,000 residential solar sites were interconnected in California; however, only 34,000 residential storage sites were interconnected¹. The introduction of NBT will shift the economics in favor of solar-plus-storage, driving customers to pair storage with their solar systems.

Tesla is the global market leader in residential energy storage. Over 450,000 Powerwall batteries have been installed around the world, with over 125,000 of them being in California. As customer demand for home storage increases in California, Tesla offers the best solution to maximize the value of solar-plus-storage systems in the new NBT landscape.

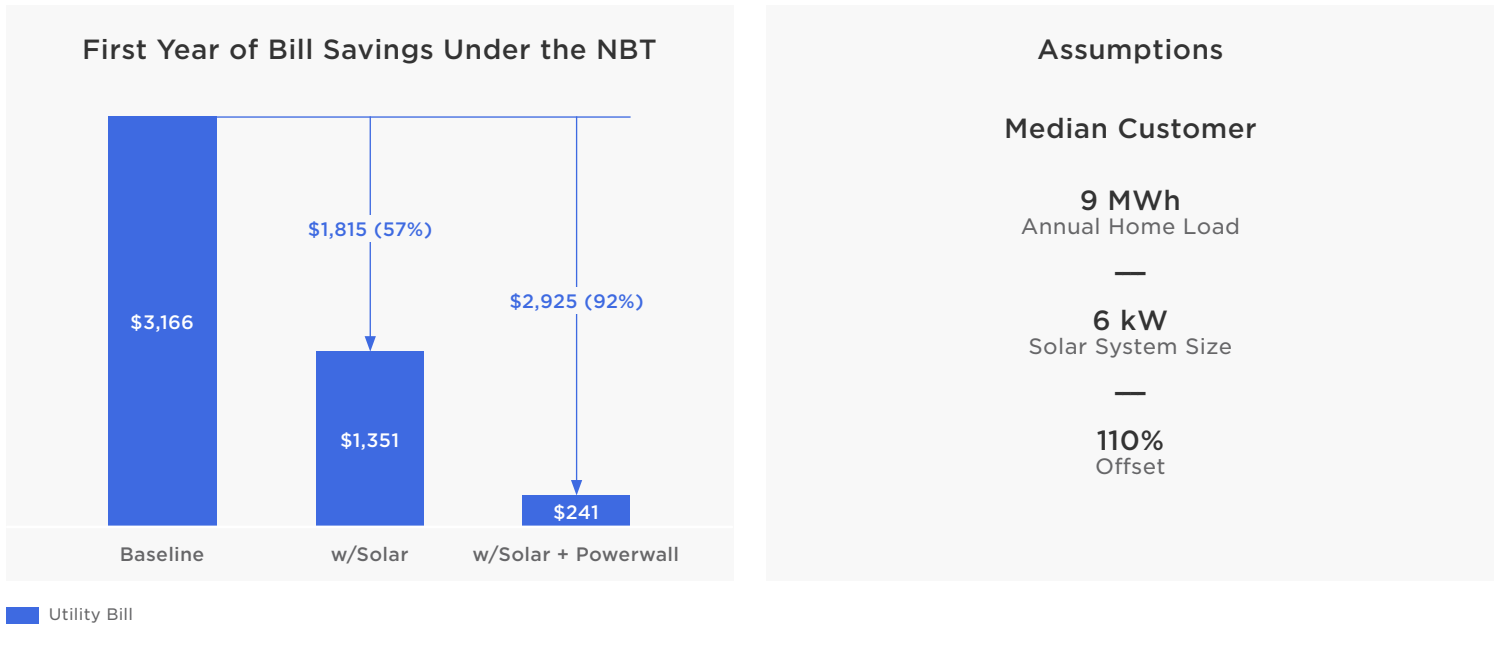
¹ <https://www.californiadgstats.ca.gov/>

NBT Impact to the Value of Energy Storage

How does the NBT impact customers' utility bills?

Much like NEM 1.0 and NEM 2.0, customers on the NBT agreement will see a reduction in their utility bills by minimizing the amount of energy they import and by being compensated for the energy that they export to the grid; however, the value of exports has changed significantly under NBT. As a result, the solar-plus-storage systems provide a much better value for most customers compared to standalone solar.

To demonstrate this, we examined data from a representative sample of our ~125,000 CA-based Powerwall batteries. We modeled the financial outlook of these customers for the first year of ownership, ten years of ownership and while financed under the NBT. Across the board, a solar-plus-Powerwall system provided the lowest energy-related costs and the best value to the end customer.



After purchasing and installing a solar or a solar-plus-storage system, the median customer can see a significant reduction in their electricity bills. A solar-only installation under the NBT will generate \$1,815 in bill savings, reducing electricity bills by 57 percent; however, adding Powerwall will result in an additional \$1,110 bill reduction, reducing that same electricity bill from \$1,351 to \$241 per year. Solar plus Powerwall results in a 92 percent bill savings for the median customer.

Storage improves bill savings due to two key factors:

01 Using more solar allows customers to save more money

Adding battery storage allows customers to store their excess solar energy and use it later, instead of sending it to the grid in exchange for minimal economic benefit. The energy solar panels generate will always be cheaper than the rate charged by utility companies for electricity from the grid. Adding storage allows customers to use more generated solar and less energy from the grid, resulting in significant bill savings.

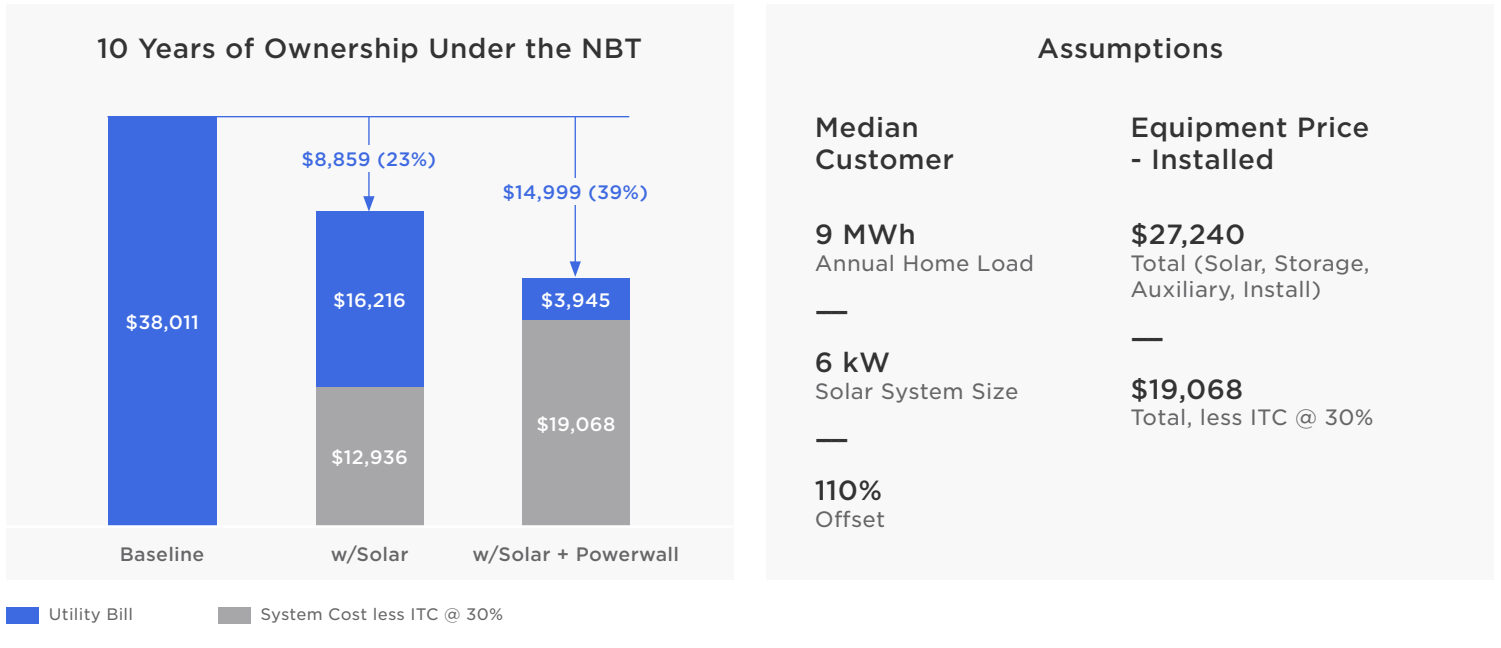
02 Earn more during “Power Hours”

When customers select Time-Based Control Mode, Powerwall will control when and how much power is exported to the grid. Powerwall will take advantage of Power Hours in the summer months when solar resources decline and demand picks up. In September, these export prices are up to 75-times higher than the lowest export prices during the month. Having a Powerwall allows customers to store their solar during the low export value times and “sell high” during Power Hours.

Isn't solar-plus-storage more expensive than solar alone?

Adding Powerwall does increase the up-front cost associated with purchasing a home energy system; however, it is an investment that pays for itself over time by providing more lifetime savings than a solar-only system, regardless of whether you pay in cash or take out a loan.

Paying in Cash



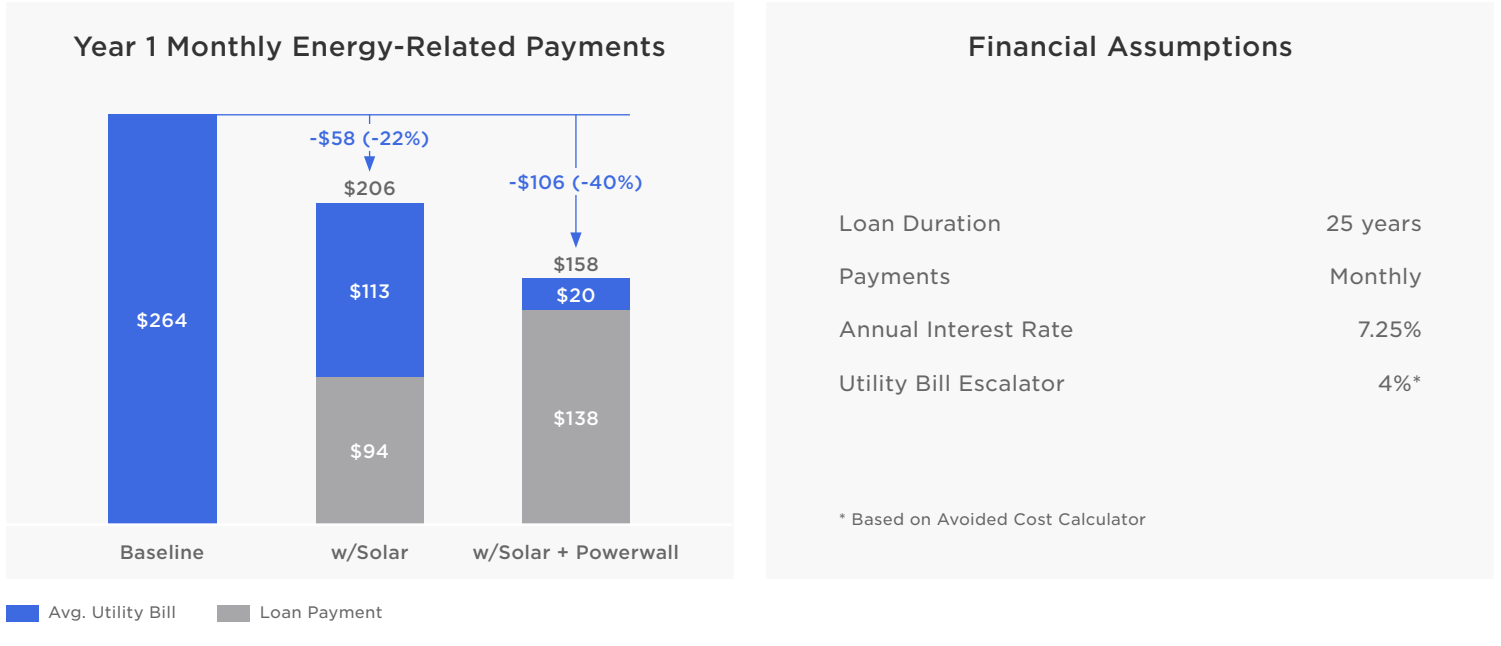
In the above analysis, the median customer has purchased their system outright and has taken advantage of the 30 percent ITC credit on their new system.

For a solar-only system under NBT, the bill savings will cover the cost of the solar system in approximately eight years. Furthermore, customers will save ~\$9,000 compared to those without a solar system.

If you add Powerwall to that same system, the customer can save ~\$15,000, a \$6,000 increase in savings with a shorter payback period of seven years². Even though the up-front cost increased by \$6,000, adding storage to the solar system pays for itself by generating extra savings.

² The 10-year increase in savings is not simply 10 times the first-year savings as the value of exports on average decreases over time.

System Financing



For financed systems, adding solar plus Powerwall is the most economical choice. Solar plus Powerwall can reduce monthly energy-related charges by 40 percent in the first year, whereas a solar-only system can only reduce payments by 22 percent. Over the first ten years of the loan term, customers can save \$4,400 in energy-related costs with a solar-only system, but will save \$11,200 with solar plus Powerwall, an increase in savings of \$6,800.

In summary, regardless of how a customer pays for their system, installing a solar-plus-Powerwall system provides the best value and return on investment under the new NBT policy. Even though adding Powerwall increases system costs, the additional bill savings make up for this increase.

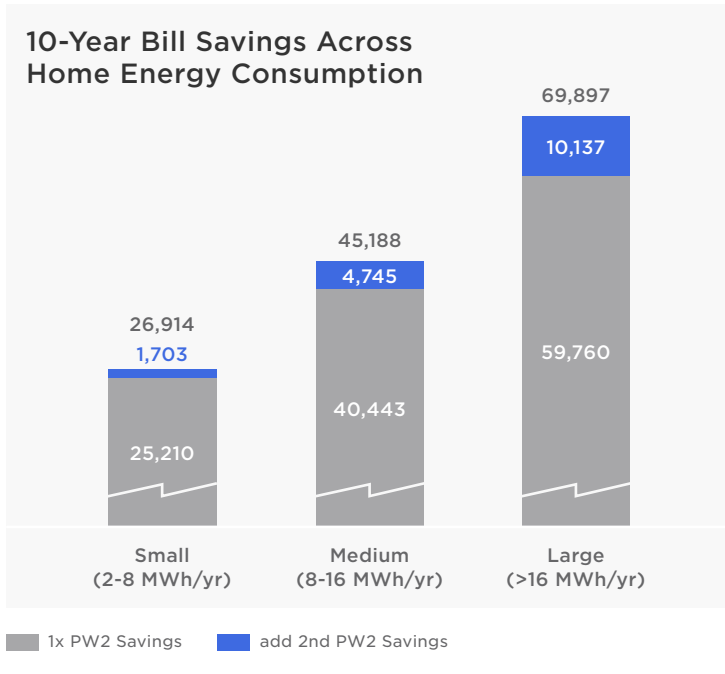
How NBT Impacts Energy System Sizing

How many Powerwall batteries are needed?

The number of Powerwall batteries connected to a solar system will affect bill savings (current and future) and backup protection. In general, adding more Powerwall batteries will both increase bill savings and provide greater backup protection. It is important to consider a home's average energy usage and budgetary requirements when making this decision.

Optimizing for Bill Savings

As described above, installing one Powerwall with a solar system results in significant bill savings under the NBT. Adding an additional Powerwall can further increase bill savings; however, the amount of bill savings generated from a second Powerwall depends on what the typical home energy consumption is.

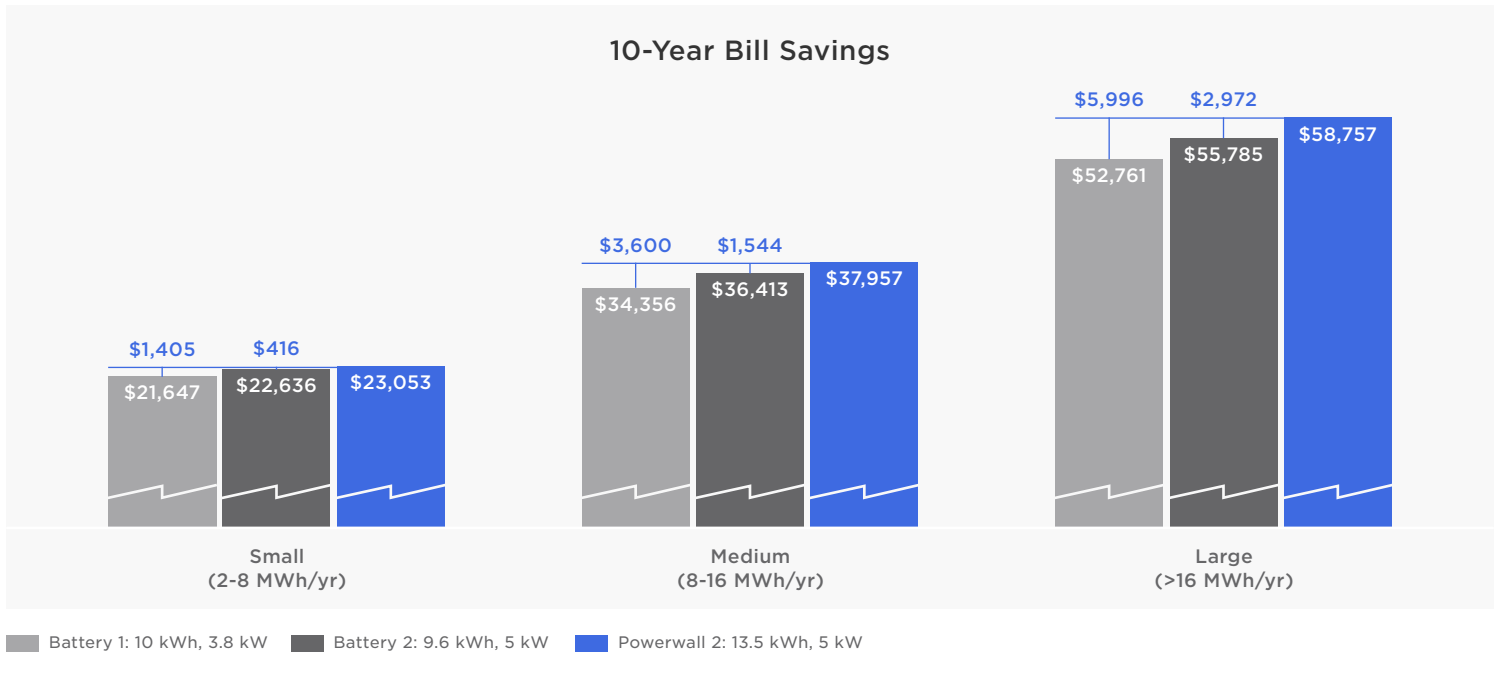
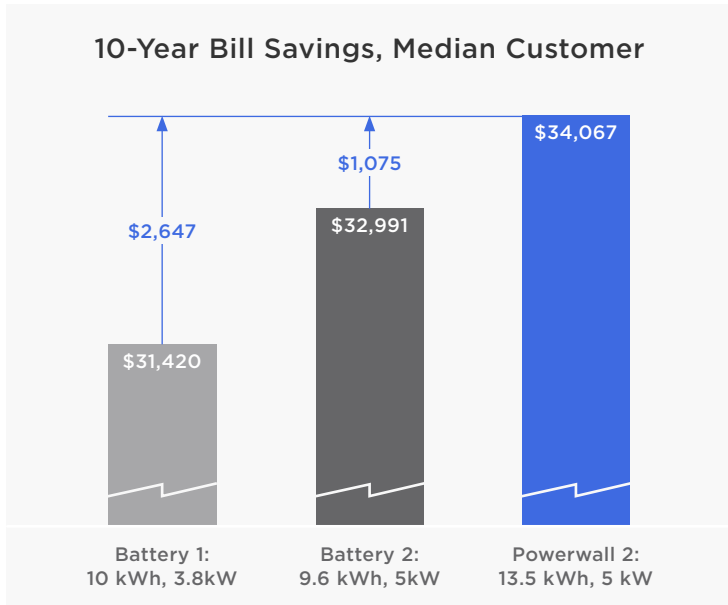


For all homes in our sample, a second Powerwall resulted in additional bill savings. For small home loads, this difference is modest (~\$1,700 over ten years); however, with larger home loads, these savings can cover the cost of installing the additional Powerwall.

Additionally, home energy consumption may change in the future. For customers who are considering switching to an induction range, an electric water heater or an electric vehicle, future home loads will increase. Adding additional Powerwall batteries to a solar system up front can support these future changes and provide additional backup protection.

Tesla Powerwall: The Industry-Leading Solution for the NBT

Battery energy capacity (kWh) and power (kW) are two of the most important specifications to consider when choosing a home battery. When comparing Powerwall to two leading competitors, the extra energy and power clearly result in increased bill savings and overall better value under the NBT.



Over the first ten years of ownership, choosing Powerwall over Battery 1 results in \$2,600 more in savings, and \$1,100 when compared to Battery 2. Clearly, Powerwall provides significant bill savings for the median customer. For larger home loads, the gap increases and Powerwall provides even greater value to customers.

NBT and the Power of Tesla

In the above analysis, we assumed that our competitors' battery products operate using the same controls and algorithms as Powerwall; however, in reality, each manufacturer uses their own software. Tesla's Opticaster software, which powers Time-Based Control Mode, has the largest installed base globally and is designed to make the optimal decisions so that connected energy systems accomplish customers' goals—be that maximizing bill reduction, improving energy independence or reserving enough backup energy for an outage.

Opticaster is built on the same platform as Autobidder, the energy trading software used by our industrial-scale Megapack batteries. Megapack batteries bid into live energy markets across the world and generate industry-leading revenue for their customers³. When compared to legacy NEM tariffs, the NBT more closely resembles a live market. Further, as the NBT is the first tariff structure of its kind in the U.S., not many companies will have as much experience in these market-like scenarios. Opticaster plus Powerwall will leverage the expertise gained from Autobidder plus Megapack and deliver value to California customers under the NBT.

Additionally, customers under the NBT will still be eligible to join Virtual Power Plants (VPPs) in California. Joining a VPP allows customers to be compensated for dispatching energy to the grid when the grid needs it most, typically during the hot summer months when electricity demand is high.

The Future of Solar and Energy Storage

Net Energy Metering has played a critical role in the development of renewable technologies. Without it, the market for solar would not be as large or as stable as it is today. The effectiveness of these policies is reflected in the real-world cost declines and increasing deployment volumes of solar. Nevertheless, the NBT is a necessary evolution of energy policy to drive technological innovation for newer technologies like energy storage and ensure that customer-sited solar continues to provide significant benefits to customers, the electric grid and the environment. Furthermore, California will not be alone in making this change—many states are considering changes to legacy net metering policies, meaning that the value of storage will continue to rise across the U.S.⁴

In California today, and in other markets in the future, Powerwall is the clear choice to unlock lower utility bills, improved sustainability and backup power across the world.

³ <https://platform.modo.energy/phase/article/7581/battery-energy-storage-leaderboard-2022>

⁴ <https://nccleantech.ncsu.edu/wp-content/uploads/2023/01/Q4-22-Solar-Exec-Summary-Final.pdf>