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ENERGYSAGE INTEL

Solar & Storage Marketplace Report 2022

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Thoughts from the CEO & Founder

We are excited to share with you the 16th edition of the *EnergySage Intel Marketplace Report*, which covers the twelve-month period from January 2022 through December 2022. Amid ongoing supply chain constraints, we continue to monitor changing trends in both the solar and storage industries through EnergySage Marketplace quotes. In this report, we explore patterns in pricing, equipment preference, Marketplace share, and financing terms for the residential solar and storage marketplaces on EnergySage.

Here are some of our top findings from our sixteenth Marketplace Report.

Solar prices continue to increase, rising over six percent year-over-year

Ongoing equipment supply constraints continue to impact pricing, as the quoted price of solar on EnergySage has increased to $2.85 per Watt, a 6.7 percent increase since the lowest price in early 2021. The installed cost of energy storage is up as well, increasing by $50 per kWh stored, or 3.9 percent, in 2022.

More shifts in market share for the top quoted solar panel brands

In the second half of 2022, Q CELLS overtook REC as the most frequently quoted panel brand on EnergySage with more than one-quarter of all quotes including Q CELLS panels. Additionally, as installers looked to secure their supply during shortages in 2022, the share of quotes represented by the top three brands on EnergySage continued to drop – from 66 percent in 2021 to 58 percent in 2022. Enphase remained the most quoted inverter and battery storage brand.

Installer brand loyalty continues to increase on EnergySage

In the second half of 2022, 59 percent of installers offered only a single inverter brand, the highest level of brand loyalty since EnergySage began tracking this information in 2014. Similarly, over one-third of installers only worked with a single solar panel brand in H2 2022, the highest level since 2015. More than just installer brand loyalty, these trends provide insight into consumer choice and supply chain availability as well.

Vikram Aggarwal

Vikram Aggarwal | CEO & Founder
EnergySage

National summary: solar pricing trends

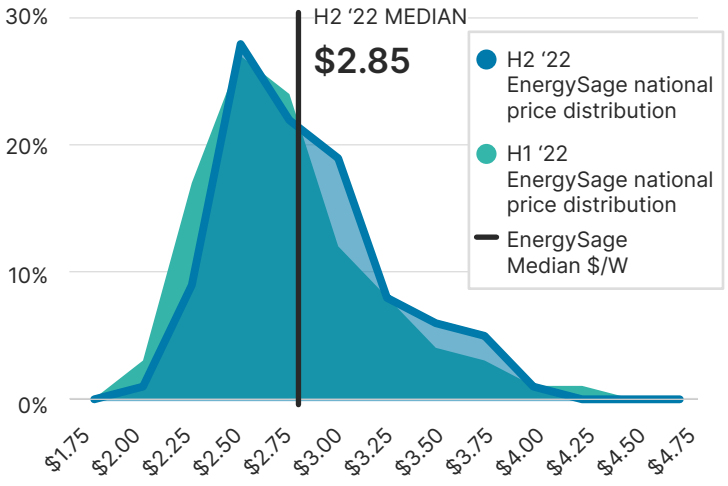
EnergySage is the leading online comparison-shopping marketplace for solar, providing custom solar quotes to shoppers from local, vetted solar companies in 42 states and Washington DC (and counting). We analyzed quotes submitted by solar companies to shoppers in the Marketplace throughout 2022. For the third six-month period in a row, the median quoted solar price on EnergySage increased – this time to **$2.85 per Watt ($/W)**, a 6.7% increase from the lowest quoted price in H1 2021 ($2.67/W).

Quoted solar prices continue to increase, rising by 2.9% since the start of 2022 and by 6.7% since the low point in H1 2021.

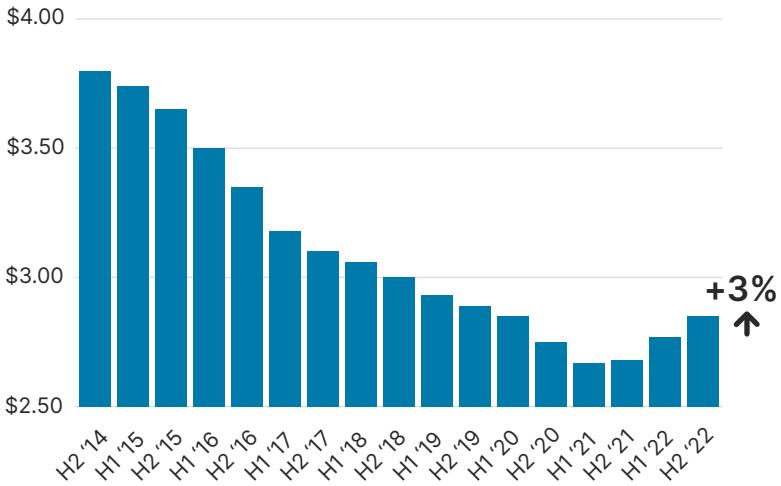
Solar prices increased by 2.9% in H2 2022

Over the course of 2022, the median quoted solar price on EnergySage increased by over 6% compared to 2021, reaching a cost of solar not seen on EnergySage since the first half of 2020. The average quoted system size for residential solar projects on EnergySage increased from 10.2 kW to 10.9 kW, while the average payback period in quotes dropped slightly, reflecting the impact of both increasing solar prices and increasing electricity prices.

EnergySage marketplace national price distribution, H2 2022



Gross cost per watt, by half year



	Payback Period	System size
H2 '22	9.1	10.2
H1 '22	8.7	10.9

National summary: storage pricing trends

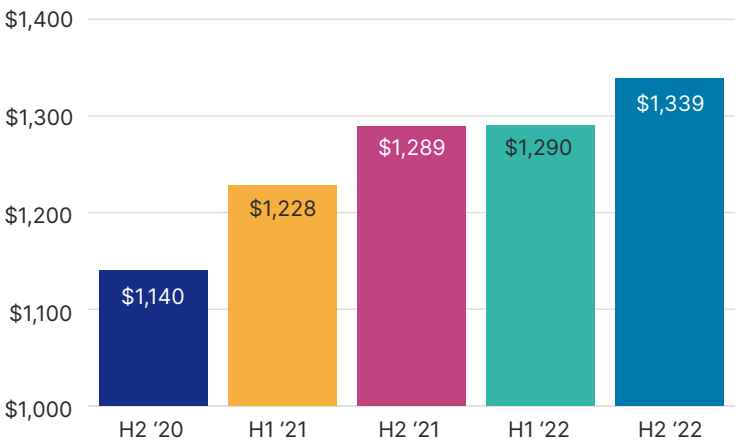
In addition to information on solar panel system quotes, EnergySage also captures data about the energy storage solutions provided in quotes to homeowners through our Marketplace, including consumer preferences for storage, battery equipment information, and pricing information. Most shoppers on EnergySage receive quotes for batteries between $13,000 and $18,000 for a single battery.

Quoted storage prices rose slightly faster than solar prices between H1 2022 and H2 2022, increasing by 3.9%.

Storage prices increased in most major markets

Nationwide, the installed cost of energy storage quoted on EnergySage increased by $50 per kWh stored, or 3.9%, between H1 2022 and H2 2022. This national-level trend was reflected at the state level as well, where quoted storage prices increased in seven of the top 10 storage markets. The median system size shifted in two states–California, Colorado, and Georgia–to reflect an increase in quotes for Tesla batteries.

Median storage pricing by half year, $/kWh



Top Storage Markets	$/kWh storage pricing			System sizing (kWh)		
	H1 '22	H2 '22	Delta	H1 '22	H2 '22	Delta
CA	$1,289	$1,290	↑	10.1	13.3	↑
TX	$1,206	$1,297	↑	10.1	10.1	–
MA	$1,563	$1,488	↓	10.1	10.1	–
FL	$1,206	$1,339	↑	10.1	10.1	–
PA	$1,488	$1,488	–	10.1	10.1	–
AZ	$1,339	$1,353	↑	10.1	10.1	–
NC	$1,188	$1,278	↑	13.3	13.3	–
CO	$1,240	$1,278	↑	10.1	13.3	↑
VA	$1,488	$1,488	–	10.1	10.1	–
GA	$1,339	$1,353	↑	10.1	13.3	↑

Storage pricing by brand and marketplace share

The storage market in the U.S. continues to rapidly evolve. Amid ongoing supply chain constraints and increasing global prices for rare earth metals, market dynamics–from pricing to major suppliers–are shifting from quarter to quarter in quotes on EnergySage. In the second half of 2022, the number of storage quotes submitted on EnergySage increased again (by 19%) over the first half of the year.

3.5% of storage quotes on EnergySage included options priced under $1,000/kWh in H2 2022

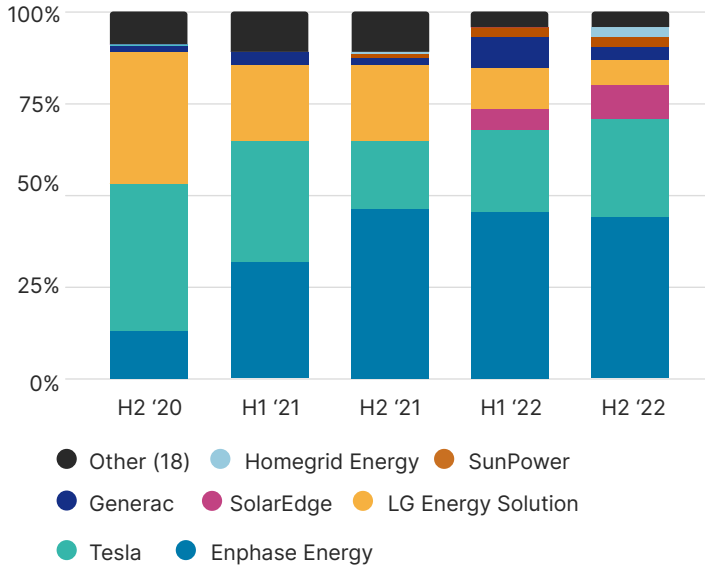
Enphase remains the most quoted; Tesla and SolarEdge gain marketplace share

During the second half of 2022, the three most quoted storage options–Enphase, Tesla, and SolarEdge–accounted for four out of every five quotes submitted on EnergySage. SolarEdge and Tesla gained the most share of quotes during this six-month period, especially in Q4 2022. Notably, Homegrid Energy–the lowest-cost battery quoted on EnergySage–was the only battery priced under $1,000 per kWh to be included in more than 1% of all storage quotes in H2 2022.

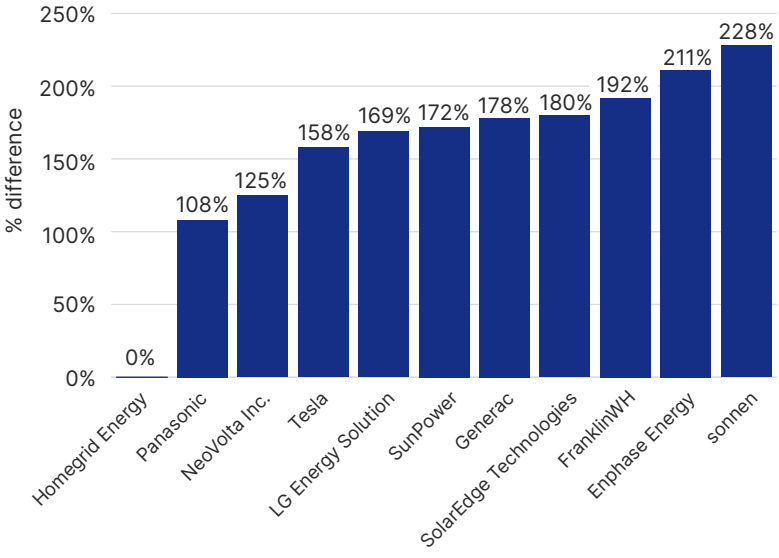
Only 3.5% of quotes include batteries priced below $1,000/kWh stored

Homegrid Energy was the lowest-cost battery quoted on EnergySage in the second half of 2022 by a wide margin, being quoted at nearly half the price per stored kWh of other brands. Of battery brands included in at least 1% of storage quotes on EnergySage in H2 2022, Enphase is the highest cost option on a $/kWh stored basis.

Storage marketplace share by half year



Percent difference from least expensive option



Consumer preference regarding storage

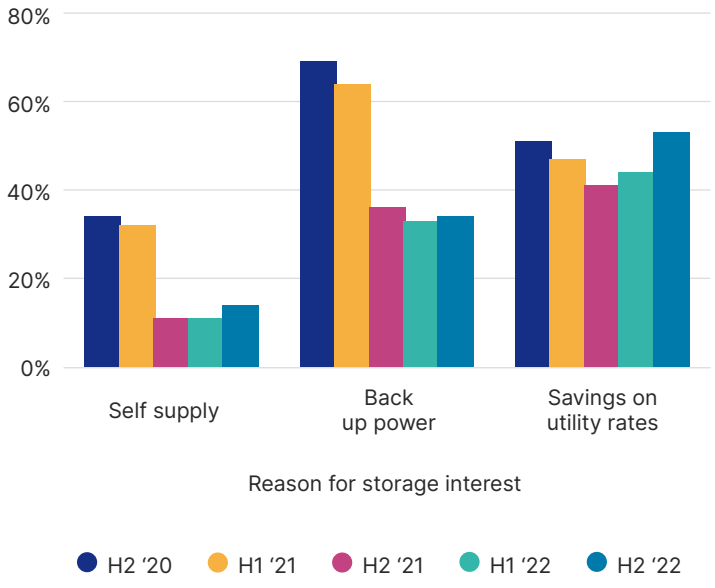
Consumer interest in energy storage remains high on EnergySage, but dropped slightly in the second half of 2022: 67% of EnergySage consumers requested storage quotes during H2 2022, down from 68% in H1 2022. Similarly, the nationwide storage attachment rate on EnergySage decreased over the last two half-year periods, from 15.5% in H2 2021 down to 14% in H2 2022.

Both consumer interest in storage quotes and overall storage adoption rates dropped slightly between H1 2022 and H2 2022.

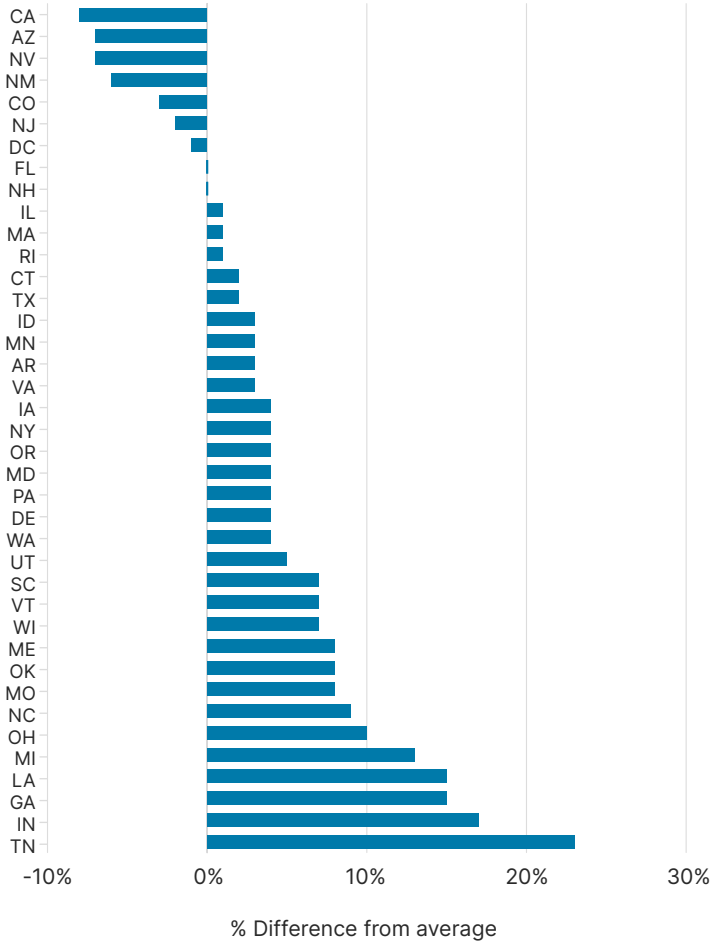
Financial savings continue to drive consumer interest in storage

In consumer research EnergySage conducted at the end of 2022, survey responses indicated that the primary driver of interest in energy storage is to save money. Data from EnergySage confirms this trend: when asked why they're interested in receiving storage quotes, over half of EnergySage consumers pointed to financial savings.

Why are consumers interested in storage?



Percent difference in storage interest from national average



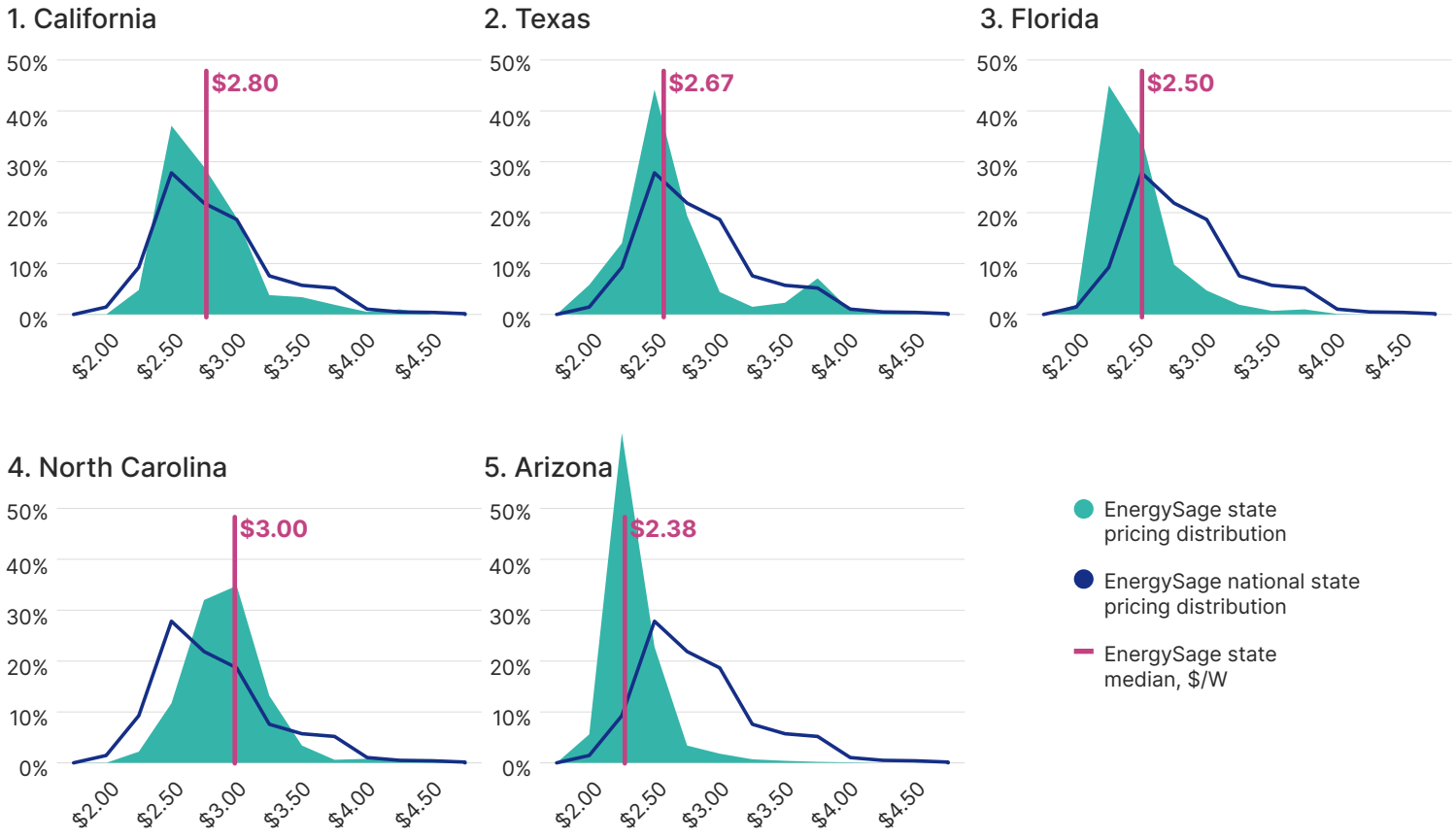
Price distribution in select states

To provide a sense of market dynamics in different states and regions, EnergySage analyzed Marketplace quote data for the second half of 2022 for the 10 states with the most cumulative solar electric capacity, according to the Solar Energy Industries Association (SEIA).

In four of the top five solar markets, the median residential price on EnergySage was lower than the median quoted price nationally.

States 1-5: Top solar markets continue to drive national median pricing lower

For the fourth *2022 Marketplace Report* in a row, four of the top five solar states (excluding North Carolina) witnessed median quoted prices on EnergySage below the national median price. Arizona and Florida witnessed the lowest quoted solar prices on EnergySage in H2 2022, while Texas saw the fifth lowest quoted prices.



Price distribution in select states

To provide a sense of market dynamics in different states and regions, EnergySage analyzed Marketplace quote data for the second half of 2022 for the top 10 states with the most cumulative solar electric capacity, according to SEIA.

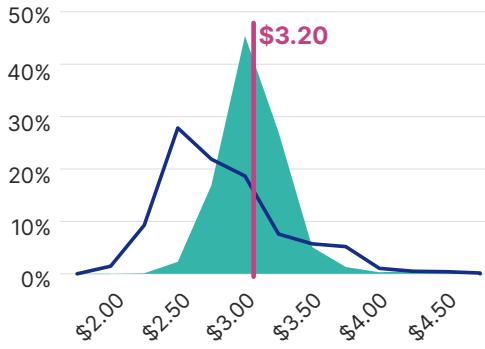
East Coast states continue to hold the seventh through tenth spots for cumulative solar electric capacity, despite high residential solar prices.

States 6-10: Strong solar markets despite higher solar costs

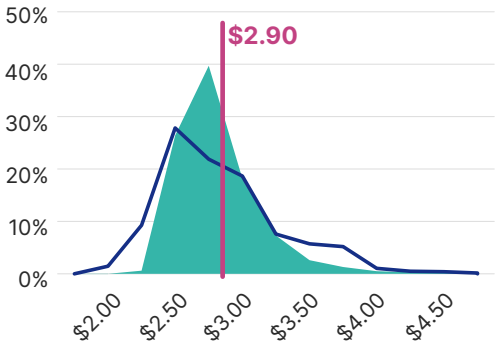
Prices remained above the national median quoted price in the seventh through tenth solar markets in H2 2022, all of which are East Coast states. Solar prices in Nevada approached the national median price, increasing substantially from the first half of the year. In three of the five states in this category, the median quoted residential prices for solar was above $3/W, a level not seen nationally since the second half of 2018.

6. Nevada

7. Georgia

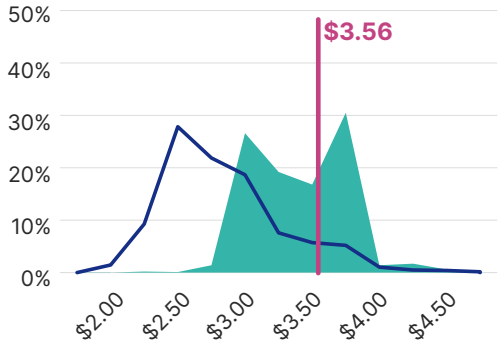


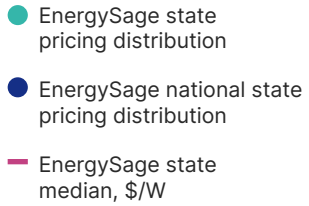
8. New Jersey



7. New York

8. Massachusetts





Solar system characteristics in select states

Solar installers customize every quote for solar shoppers on EnergySage, meaning that solar panel system characteristics vary from quote to quote. Over the course of 2022, average quoted system sizes increased in all of the top 10 solar markets, in some cases by more than a kilowatt of capacity. At the same time, solar prices increased in all but two of the top 10 markets.

Quoted system sizes increased across the board in each of the top 10 solar markets between H1 and H2 2022.

National shifts in pricing and system sizes reflected in top solar states

Nationally, the average quoted solar price increased by 2.9% and system sizes increased by 0.7 kW. At the state level, solar prices increased by at least that much in six of the top 10 markets, while quoted system sizes increased by at least 0.7 kW in five of the top 10 markets. Meanwhile, average monthly electricity consumption and percent offset were not as correlated with average system sizes as in previous six-month periods.

States	Residential Rank	System Size (kW)			Usage Offset (%)	Median $/W			Average Monthly Consumption (kWh)	Avg Elec Rate Oct 2022 (c/kWh)
		H1 2022	H2 2022	Delta	H2 2022	H1 2022	H2 2022	Delta		
California	SEIA #1	8.0	8.5	↑	104%	$2.70	$2.80	↑	513	25.49
Texas	SEIA #2	12.4	13.6	↑	94%	$2.64	$2.67	↑	989	14.77
Florida	SEIA #3	12.8	14.1	↑	100%	$2.45	$2.50	↑	1,024	14.21
North Carolina	SEIA #4	12.2	12.3	↑	94%	$3.00	$3.00	–	769	13.51
Arizona	SEIA #5	11.0	11.9	↑	102%	$2.25	$2.38	↑	925	13.10
Nevada	SEIA #6	11.0	12.3	↑	100%	$2.45	$2.70	↑	790	15.23
Georgia	SEIA #7	11.5	12.0	↑	86%	$3.22	$3.20	↓	843	14.31
New Jersey	SEIA #8	11.3	11.8	↑	92%	$2.77	$2.90	↑	439	16.42
New York	SEIA #9	10.9	11.3	↑	93%	$3.28	$3.43	↑	481	23.29
Massachusetts	SEIA #10	9.1	9.8	↑	95%	$3.29	$3.56	↑	496	26.28

State cost differential from national average

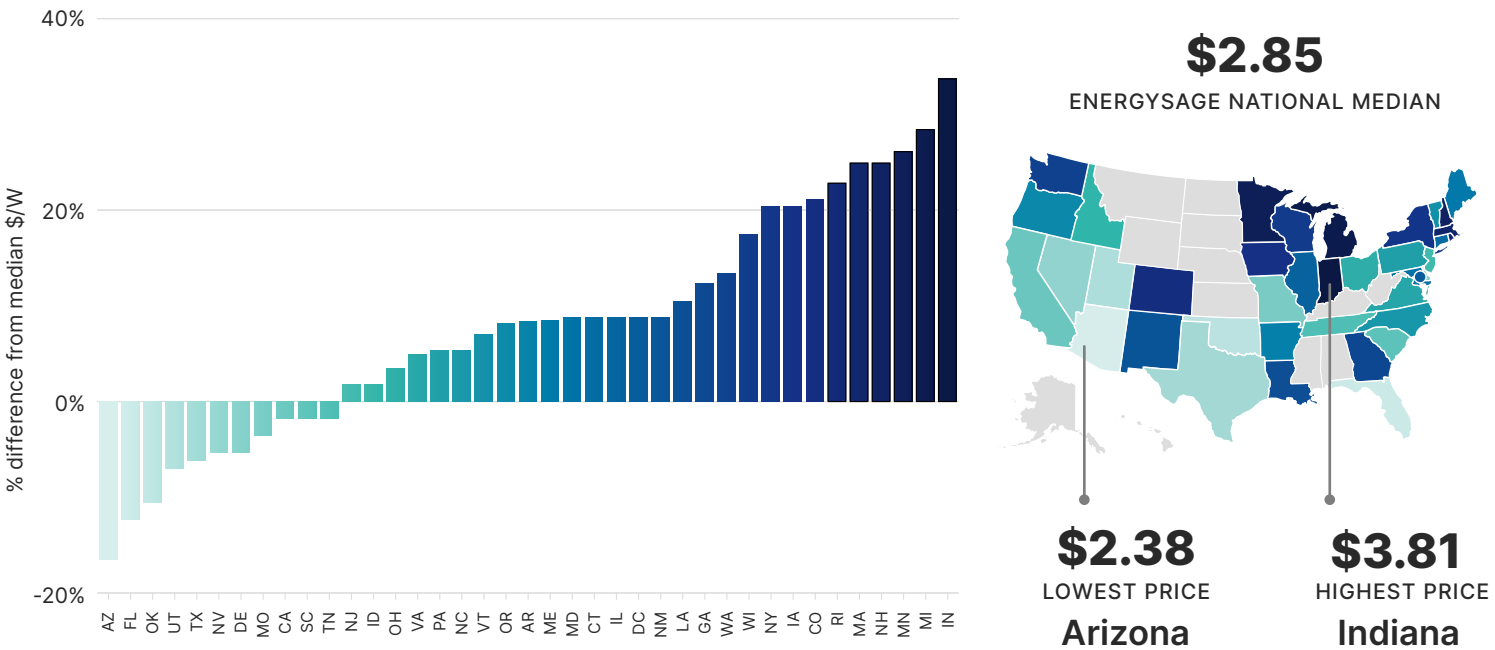
For the fifth *2022 Marketplace Report* in a row, Arizona saw the lowest median quoted solar costs on EnergySage despite prices increasing 6% over the course of 2022 to $2.38/W. In the second half of 2022, Indiana had the highest median cost at $3.81/W, nearly an entire $1/W higher than the national median price.

The difference between median solar prices in the lowest cost state (Arizona) and the highest cost state (Indiana) grew to $1.43/W.

North Central U.S. continues to see higher solar prices than the rest of the U.S.

For the third *2022 Marketplace Report* in a row, the highest solar prices on EnergySage were in the North Central U.S. In fact, prices in Indiana, Iowa, Michigan, Minnesota and Wisconsin were all at least $0.50/W higher than the national median price. Arizona remained the lowest-priced state, despite a significant increase in solar prices as compared to the first half of 2022. These price differences mean that a quote for the median system size in Arizona would be over $15,000 less expensive than a quote for the same system in Indiana.

State system size difference from EnergySage national average



Solar system sizes: difference from national average

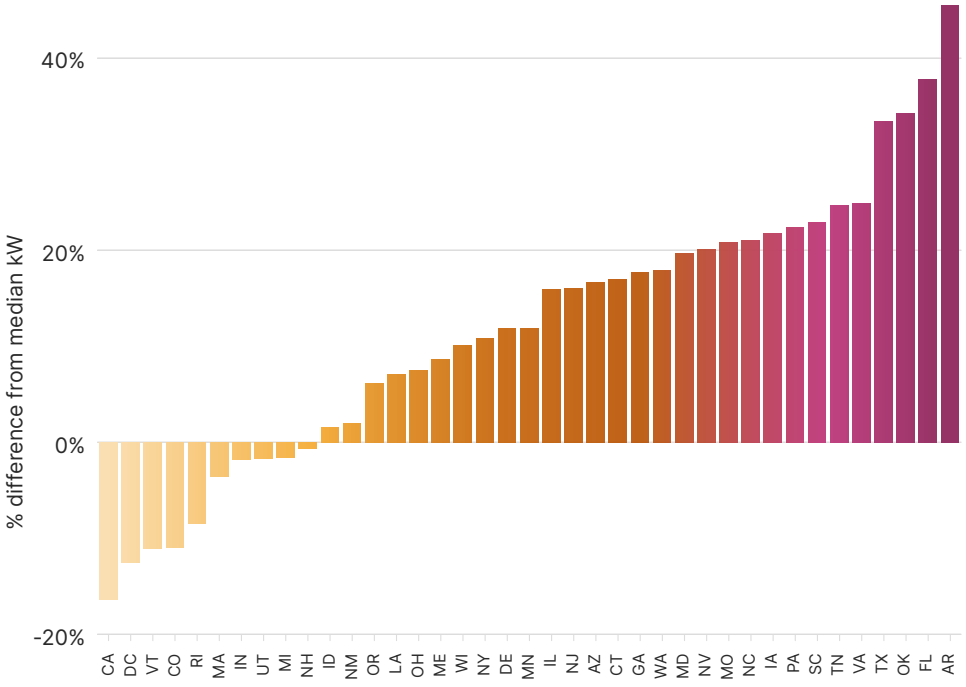
Across the country, average quoted system sizes ranged from a minimum of 8.5 kW in California to a maximum of 14.85 kW in Arkansas. Of the states analyzed, less than one-third were within one kilowatt of the median average system size nationally in H2 2022, compared to over half of states in H1 2022.

The spread between the states with smallest and largest average quoted system size decreased to 6.32 kW in H2 2022.

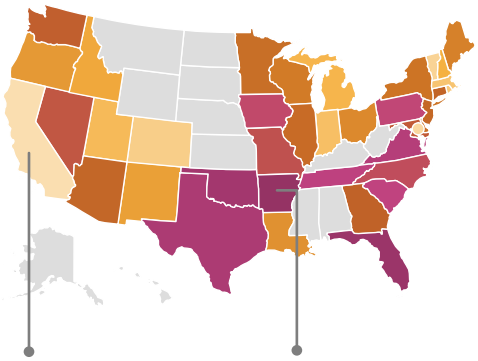
System sizes remain larger in the South and Southeast

The seven states with the largest quoted system sizes in H2 2022 are all south of the Mason-Dixon line. On the other hand, five of the six states with the smallest system sizes are either in the West or the Northeast. For the second six-month period in a row, the spread between the smallest and largest quoted system sizes on EnergySage decreased in H2 2022, this time to 6.3 kW. If systems in California and Arkansas were both quoted at the national median price, the difference in cost for these average systems would be nearly $18,000.

State system size difference from EnergySage national average



10.9 kW
ENERGYSAGE NATIONAL AVG.



8.53 kW
SMALLEST SYSTEM
California

14.85 kW
LARGEST SYSTEM
Arkansas

Marketplace share: equipment

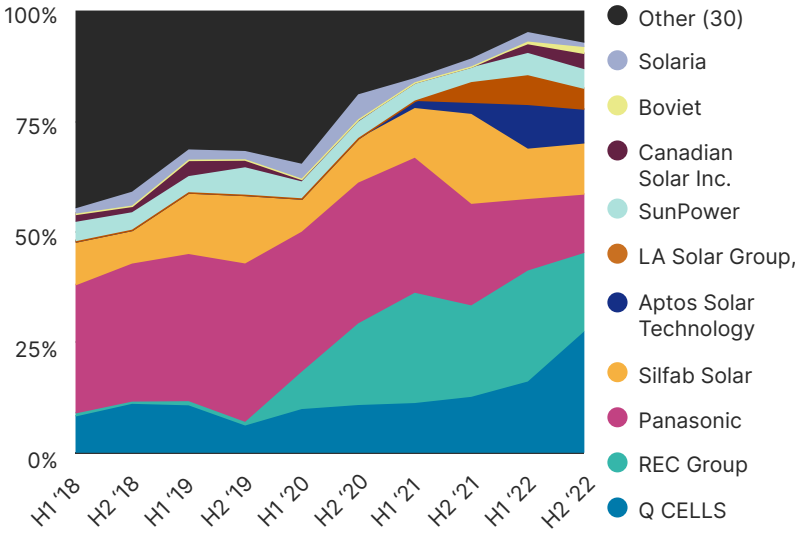
EnergySage Marketplace equipment share data are pulled from quotes provided by solar installers to consumers on the EnergySage online platform. As a result, Marketplace share is indicative of consumer preference and the resultant sales behavior of small-to-midsize solar installers; it is also an indicator of equipment availability in light of supply chain constraints.

QCELLS overtook REC as the most frequently quoted solar panel brand on EnergySage in H2 2022; Enphase remained the most quoted inverter brand.

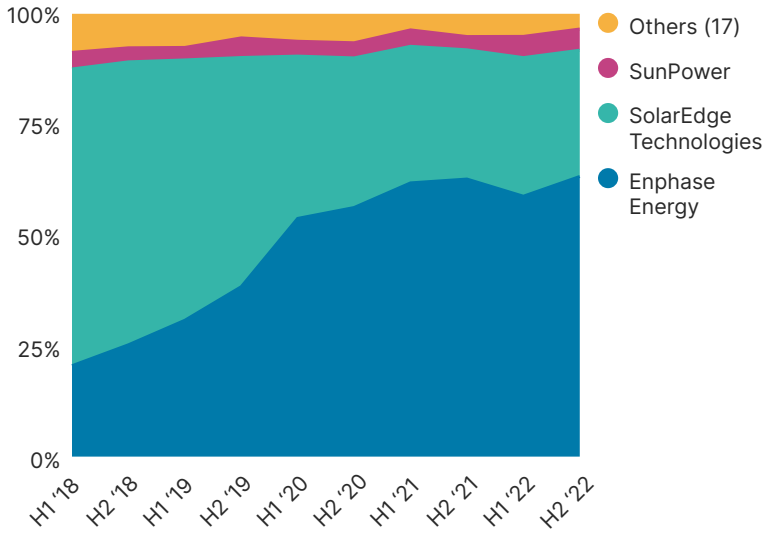
Shift at the top of marketplace share for panel brands in H2 2022

For the last two years, QCELLS has been steadily gaining Marketplace share on EnergySage and overtook REC as the most frequently quoted brand in the second half of 2022 with more than one quarter of all quotes. Additionally, as installers looked to find secure supply during shortages in 2022, the share of quotes represented by the top three brands on EnergySage continued to drop–from 66% of quotes in 2021 to 58% in 2022. Enphase remained the most quoted inverter brand on EnergySage for the sixth straight *2022 Marketplace Report*, gaining Marketplace share in H2 2022: combined, Enphase + SunPower branded (Enphase) inverters were included in 68% of quotes.

Top panel brands



Top inverter brands



Solar equipment characteristics

EnergySage analyzed the quoted cost per Watt by system size in H2 2022, as well as the wattage of panels quoted over the last five years. Quotes on EnergySage continue to generally demonstrate economies of scale in pricing as system sizes increase, with a few exceptions. 390-400 Watt panels were the most quoted throughout all of 2022.

One in five solar panels quoted on EnergySage was 400W or larger in H2 2022, more than double the percent of 400W panels quoted a year earlier.

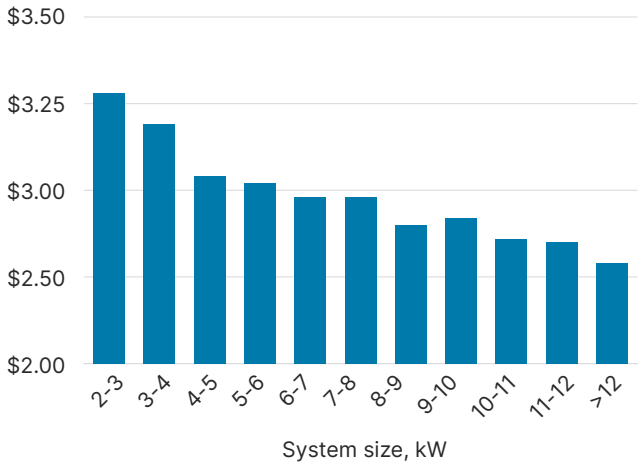
Installers are increasingly quoting larger solar panels

In the second half of 2017, 16% of quotes on EnergySage included solar panels rated to produce 330 Watts or more. Five years later, during H2 2022, 99.7% of quotes on EnergySage included panels rated at 330 Watts or greater, while over 18% of quotes included solar panels rated to produce more than 400 Watts.

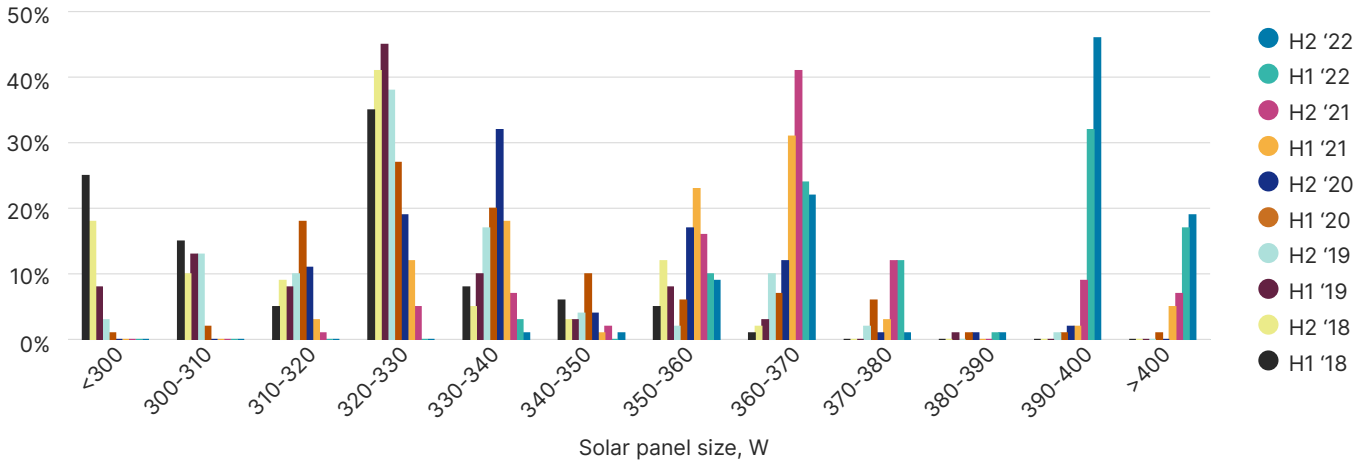
Larger system sizes continue to drive lower prices

As solar system sizes increase, the price of an installation generally decreases on a dollar per Watt ($/W) basis. Generally, those installing systems greater than 12 kW pay 15% less on a $/W basis compared to those installing 2 to 3 kW systems, which translates to a $0.49/W difference.

Solar cost vs system size, $/W by kW



Percent of quotes by panel size



Installer equipment offerings

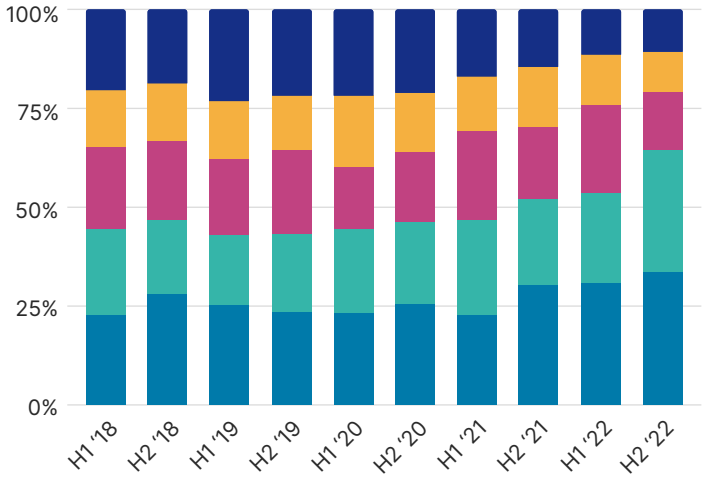
Tracking installer equipment offerings over time provides a useful metric for analyzing consumer choice, installer brand loyalty, and supply chain availability. In the second half of 2022, the percentage of installers who only submitted quotes including one panel brand or one inverter brand increased by 10% and 11%, respectively.

Installer brand loyalty continues to increase for solar panels and inverters quoted on EnergySage.

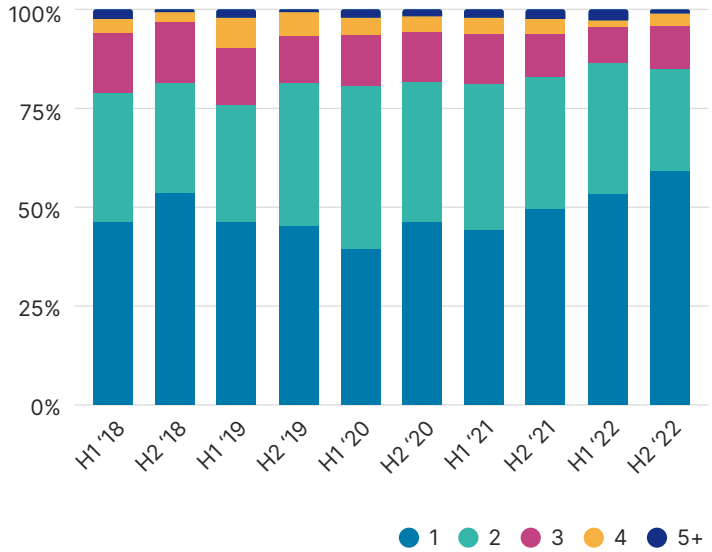
Installers on EnergySage worked with fewer equipment manufacturers in H2 2022

In the second half of 2022, 59% of installers offered only a single inverter brand, the highest level of brand loyalty we've seen in any six-month period since EnergySage began tracking this information in 2014. At the same time, over one-third of installers only worked with a single solar panel brand in H2 2022, the highest level since 2015. Only 15% of installers offered more than two different brands of inverters, while 36% of installers quoted more than two different brands of solar panels.

Number of panel brands offered per installer



Number of inverter brands offered per installer



Installer equipment pairings & price

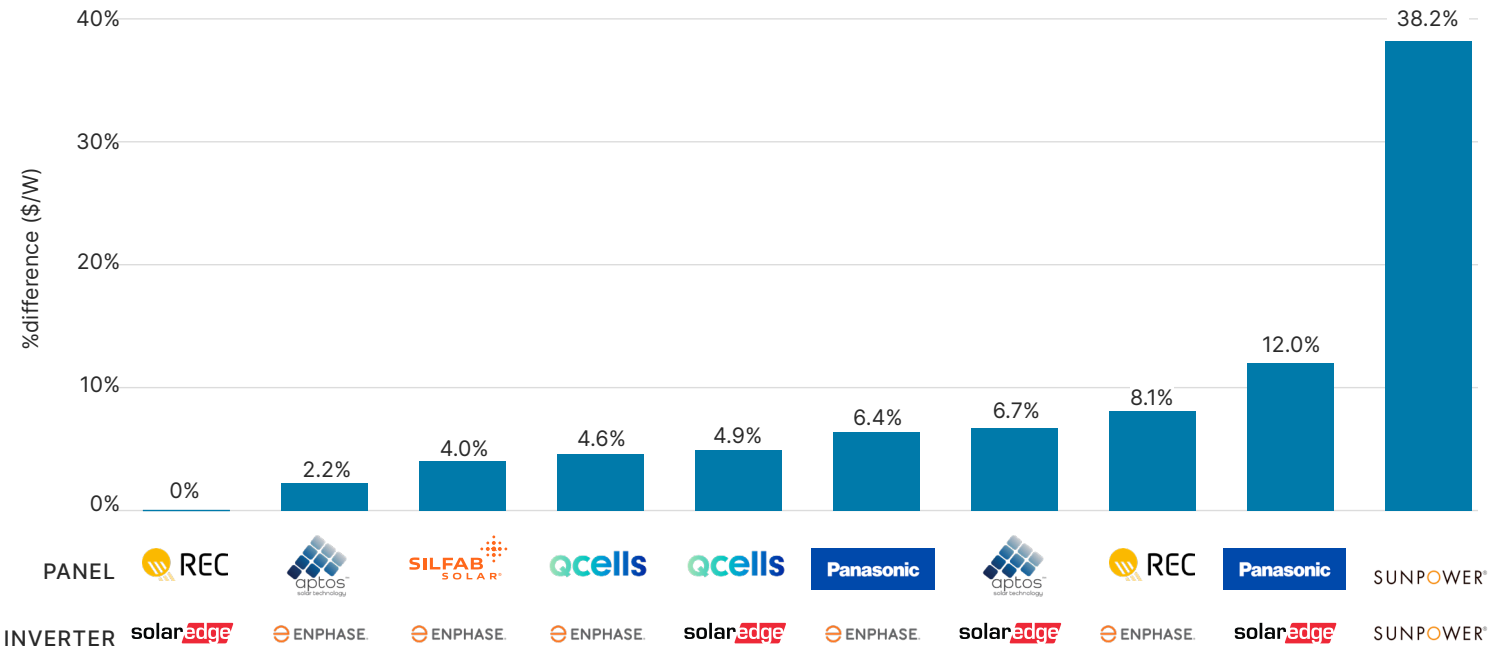
EnergySage analyzed the comparative cost differences across the 10 panel and inverter pairings quoted most frequently to Marketplace shoppers over the second half of 2022. Supply constraints are continuing to cause variability in pricing for different brands of equipment. In H2 2022, the spread between the lowest-priced option and the highest-priced, non-SunPower option was just over $0.30/W.

Panels paired with Enphase inverters were quoted at a lower price than with SolarEdge inverters in H2 2022.

SunPower remains the highest cost option on EnergySage

In H2 2022, solar panel brands were quoted with Enphase inverters at a lower price than the same solar panel brands with SolarEdge inverters, for all but one panel–inverter pairing (which was the lowest overall). SunPower equipment continues to be significantly more expensive: systems with SunPower solar panels and SunPower inverters were, on average, quoted at a full dollar per Watt more than the lowest priced option (REC + SolarEdge).

Price difference from least expensive equipment pairing



Map of equipment preferences by state

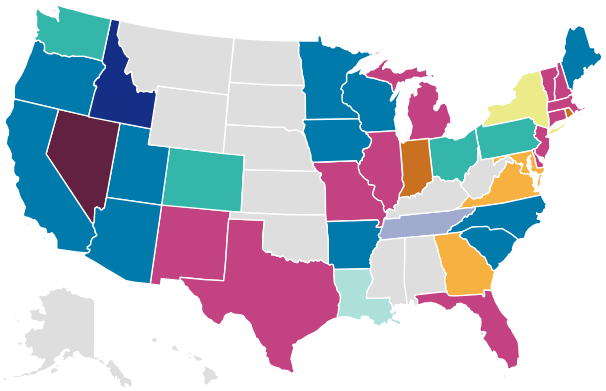
From costs to consumer preferences to installer offerings, the solar market varies significantly from state to state. Tracking installer equipment offerings and pricing at the national level only tells one piece of a much larger story. To get a better feel for regional- and state-level dynamics of the residential solar market, EnergySage analyzed the most quoted equipment pairings by state.

Q CELLS overtakes REC as the most frequently quoted solar panel brand in the most states.

State-level trends reflect national shifts in equipment Marketplace share

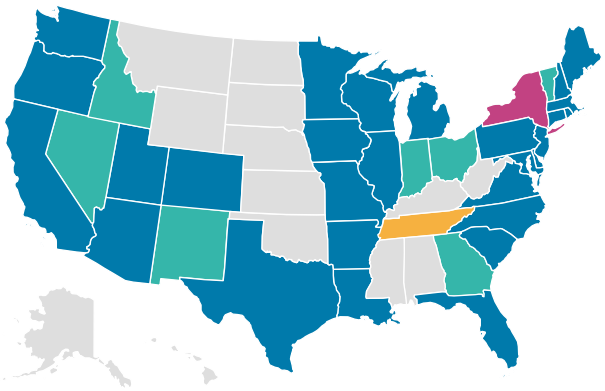
Just as Q CELLS overtook REC as the most quoted solar panel brand nationally in H2 2022, Q CELLS also became the most frequently quoted panel brand in the most states in the second half of the year (13 states to 11 for REC). Enphase remained the most quoted inverter brand in the most states (29). When paired with Enphase inverters, those same panel brands–REC and Q CELLS–tied as the most frequently quoted panel–inverter combo, with each preferred in 11 states.

Most frequently quoted panel brand by state



REC · Silfab Solar · Q CELLS · Aptos Solar · SunSpark Technology · Panasonic · Tesla · LA Solar Group · SunPower · Solaria

Most frequently quoted inverter brand by state



Enphase Energy · SolarEdge Technologies · SunPower · Sol-Ark

Financing products

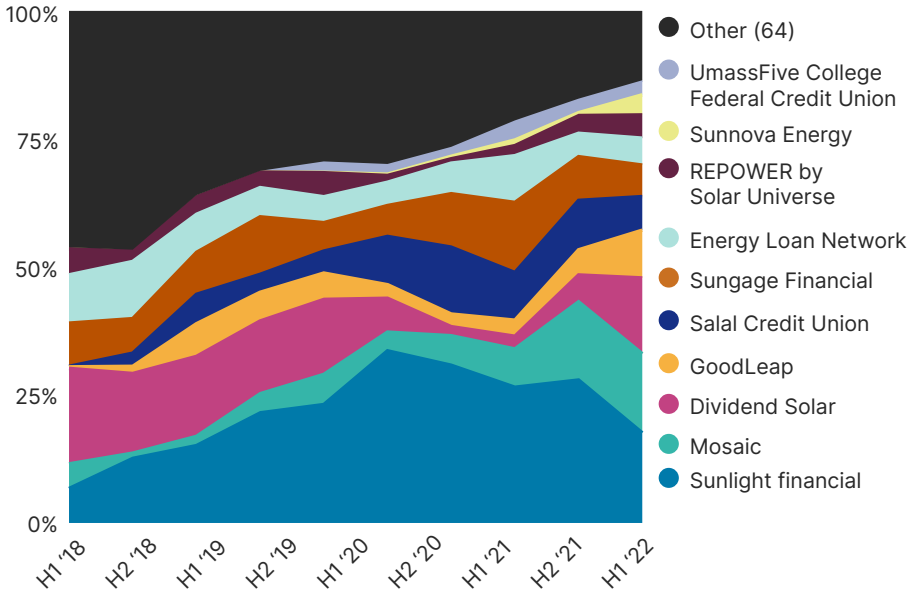
Many solar shoppers are now choosing to finance their systems with solar loans on EnergySage and across the broader solar market; however, financing still remains quite fragmented. In fact, only three financing companies were included in more than 10% of quotes in H2 2022; meanwhile, the most-quoted financing company–Sunlight Financial–dropped from a 34% share of quotes on EnergySage in H2 2020 to an 18% share in H2 2022.

In H2 2022, more solar installers worked with three financing companies than with a single one.

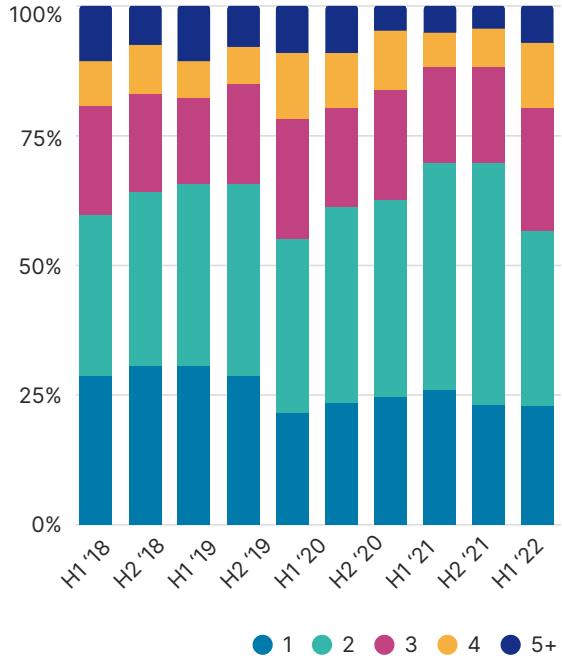
Financing market fragmentation reflected in installer financing offers

Prior to H2 2022, the percentage of solar installers offering loans from only one or two financing providers steadily increased to 70% of installers. However, in the second half of 2022, this trend reversed, with only 57% of installers now quoting loans from one or two companies. At the same time, the percentage of installers quoting loans from three different companies on EnergySage was higher than the percentage offering only a single provider's loan products.

Financing Provider Marketplace Share



Number of Loan Brands Offered per Installer



Price dispersion for EnergySage customers

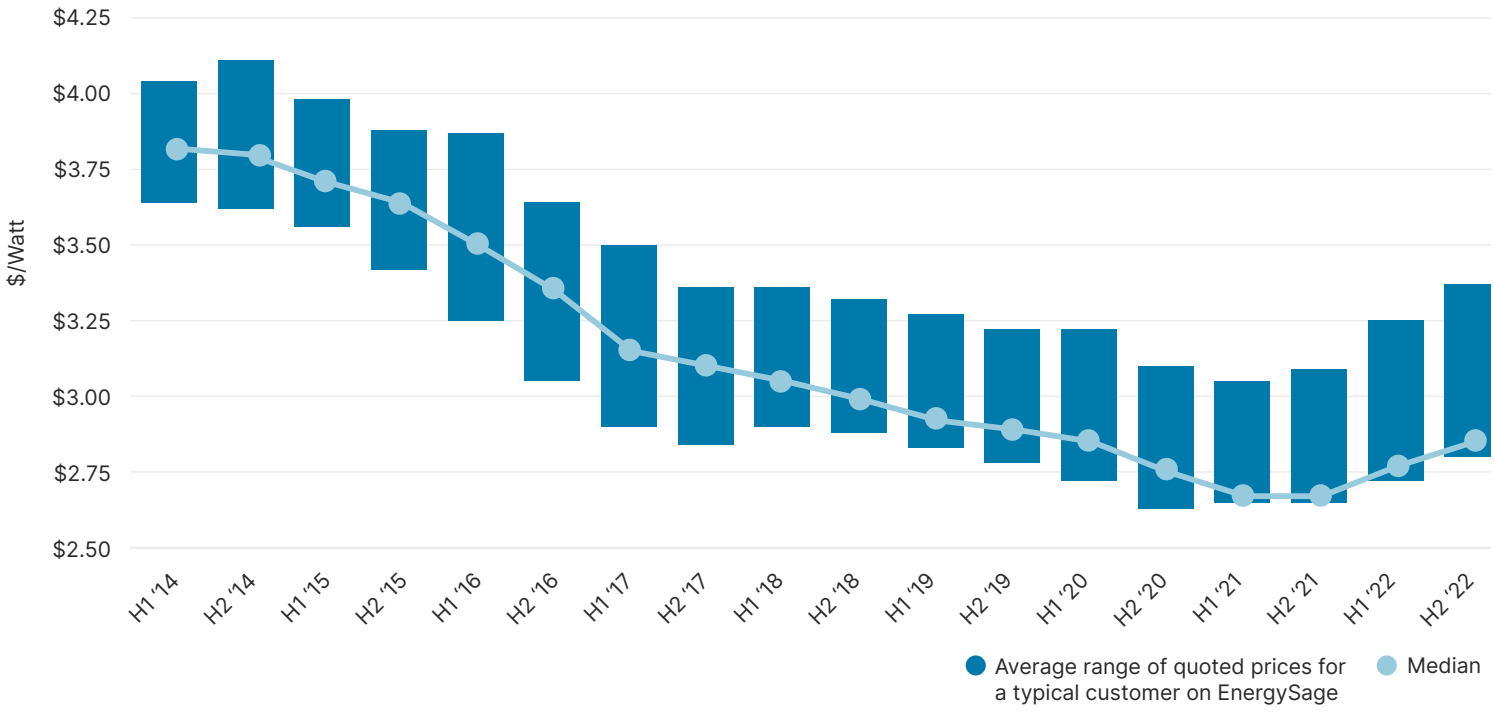
On EnergySage, solar shoppers compare custom quotes from up to seven solar installers head-to-head in our online Marketplace. From the quality of solar equipment to the ratings and reviews of the installer, there are a variety of factors to consider when making a solar decision – the price is often not the leading decision-making factor. In fact, despite national cost increases, **61% of EnergySage shoppers did not select the lowest-priced quote that they received during 2022**. To track how the range of quoted prices has changed over time, EnergySage analyzed the prices of the minimum, median and maximum quotes that each individual shopper received.

The minimum, median & maximum quoted solar prices for typical solar shoppers on EnergySage all increased between H1 2022 & H2 2022.

The average spread between quotes increased in H2 2022

For the second six-month period in a row, the range between the minimum and maximum quoted prices for the average solar shopper on EnergySage increased, from $0.53/W in H1 2022 to $0.57/W in H2 2022. For an average system size of 10.9 kW on EnergySage, this means a difference of $6,300 in upfront costs between the lowest and highest priced quote that typical solar shoppers are seeing. While both the average minimum and maximum quoted price on EnergySage increased again between H1 2022 and H2 2022, the median quoted price increased faster.

Customer price dispersion over time



In case you missed it

Solar Installer Survey 2021 Results
Download

Solar Marketplace Intel Report H2 2021 to H1 2022
Download

2022 Consumer Survey
Download

What can EnergySage data do for you?

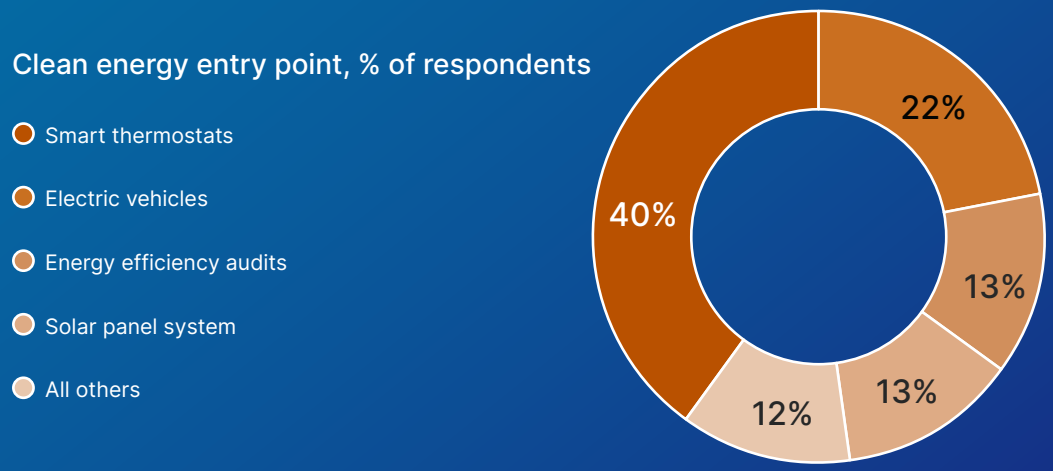
EnergySage is the most visited website in the solar industry and the leading online comparison-shopping marketplace for solar, storage, and now community solar in the country.

The EnergySage Marketplace data included in this report reviews over twenty million transaction-level data points from custom solar quotes provided to active solar shoppers on EnergySage from January through December 2022. For additional market insights, download our 2021 Solar Installer Survey, which analyzes responses from 500+ solar companies.

Although this report presents this data aggregated at a high level, EnergySage selectively partners with different organizations in the solar industry to provide custom data reports, including equipment manufacturers, national research laboratories, and investment firms. If you're interested in custom solar data reports, explore our options at energysage.com/data or email us at intel@energysage.com to set up a consultation today.

According to the 2022 Consumer Survey respondents, there are four primary entry points into the clean energy revolution: just under a quarter of people begin with smart thermostats, while about one in eight people begin with either energy efficiency retrofits, an EV, or solar on their roof.

Clean energy entry point, % of respondents



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energysage

EnergySage is the leading online comparison-shopping marketplace for rooftop solar, energy storage, project financing, and community solar. Supported by the U.S. Department of Energy, EnergySage is trusted by over 10 million consumers across the country to help them make smarter energy decisions through simplicity, transparency, and choice. Unlike traditional lead-generation websites, EnergySage empowers consumers to request and compare competing quotes online from a network of more than 500 pre-screened installation companies – a formula that is proven to result in a higher rate of adoption, 20 percent lower prices on average for consumers, and significantly lower costs for renewable energy providers. For these reasons, leading organizations like Intuit, Connecticut Green Bank, Duke University, Environment America, Kaiser Permanente, and National Grid refer their audiences to EnergySage.

Visit EnergySage for more information, and follow us on Facebook, Instagram, LinkedIn, Twitter, and YouTube.