



2022 Solar Industry Survey Results

Released May 2023



Executive summary

The inaugural year of the SolarReviews Solar Industry Survey in partnership with NABCEP was a resounding success. The Survey was designed to examine how the solar industry fared in 2022 compared to 2021, identifying which trends are driving or hindering the success of solar around the country.

This report contains important findings about how companies responded to various issues in 2022, a year in which the industry continued to experience record growth while also facing numerous challenges.

Major issues the industry faced in 2022 included supply chain concerns, labor shortages, and increased financing costs. The Inflation Reduction Act, passed in August of 2022, contained measures to address some of these issues. Still, many companies have not yet determined how to take advantage of those opportunities.



“The results of this Survey provide essential data about how the industry has dealt with the unique challenges of 2022, from supply chain issues to a shortage of trained workers—whilst companies prepare to grow in response to the Inflation Reduction Act”

- Andrew Sendy
President of SolarReviews

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Shawn O’Brien

President & CEO of NABCEP

“The information contained in this report is vital to the solar industry’s goal of playing a crucial role in the expansion of clean energy. When NABCEP started over 20 years ago, we believed our organization would set the standard for best practices in renewable energy. We continue to hold ourselves to that high standard and will do whatever it takes to help meet the workforce development needs of future “green-collar” jobs. The data provided by our good friends at SolarReviews will lead to better education, training, and careers in the field of solar energy.”

Important trends revealed in the study include:

- **The solar industry continues to grow**
 - 63% of residential installers reported increased demand in 2022
 - 73% expect to sell more solar in 2023
- **The Inflation Reduction Act will benefit solar**
 - 62% of all respondents expect to expand business in 2023
 - 30% say they plan to take the Section 48 Investment Tax Credit (commercial ITC) for the first time
- **More installers are offering energy storage and EV charger installation**
 - 81% now provide energy storage installation, while 67% offer EV charger installation
 - 63% offer both additional services
- **Ongoing difficulties with the supply chain**
 - 93% of installers reported paying more for solar panels in 2022 compared to the year before
 - 40% of installers say supply chain issues were worse in 2022

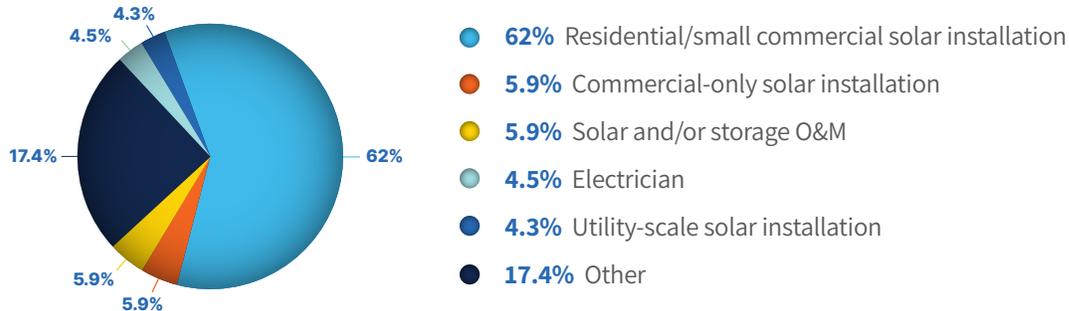
2023 will be an exciting year for solar, with the 30% tax credit available for homeowners and more solar manufacturers setting up shop in North America. We look forward to comparing the results of the 2023 survey with the results presented here. The comparisons will allow us to measure growth in the industry and see how companies handle the challenges and opportunities of the first full year after the passage of the IRA.

Please direct any questions about the Survey and Report to press@solarreviews.com.

Important note: All percentages are rounded to the nearest whole number except when necessary to highlight important differences, such as ranking items in order. Any discrepancy in addition, such as a sum of greater or less than 100% in a pie chart, is due to rounding.

Methodology and respondent overview

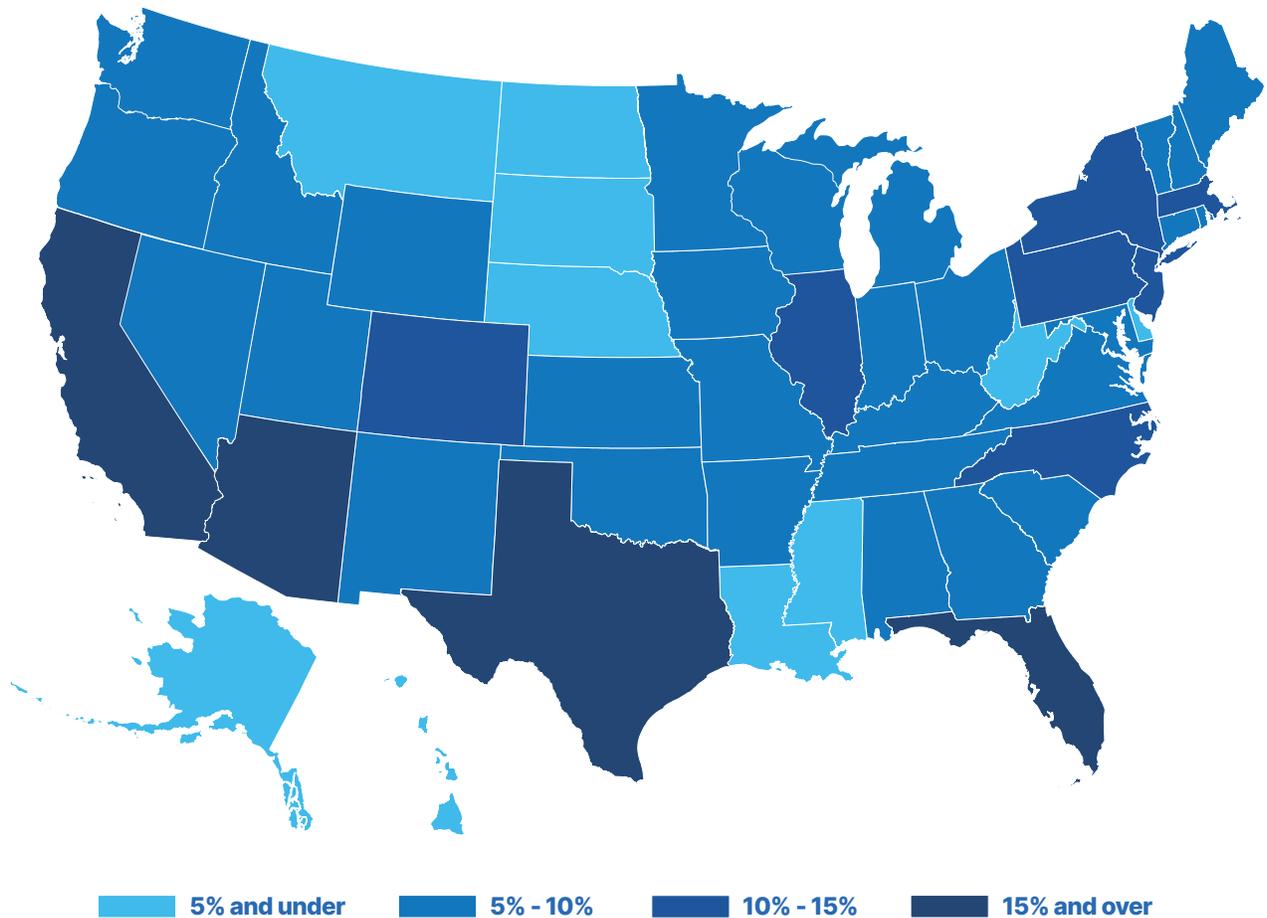
The Survey was conducted through SurveyMonkey from February 6 to March 3, 2023. Respondents were invited to participate via email and public social media posts from SolarReviews and NABCEP. In all, almost 450 participants from companies across the industry submitted responses, with the following breakdown of primary business activity:



The Survey used branching logic to ensure respondents were presented with relevant questions, with specific branches for residential/small commercial solar installers and energy storage installers. Installers were asked to report their total kilowatts (kW) of installed capacity in 2022. That data was normalized to remove outliers and then used to weight responses to other questions related to proportions, such as the percentage of various payment methods, customer demographics, and installation types.

Responses came from companies all across the country, with the majority of respondents doing most of their business in just seven states: California, Texas, Florida, New York, Colorado, Illinois, and Arizona. At least one respondent reported operations in each of the 50 U.S. states, Washington, D.C., and Puerto Rico.

States with highest proportion of survey respondents



Industry-wide information

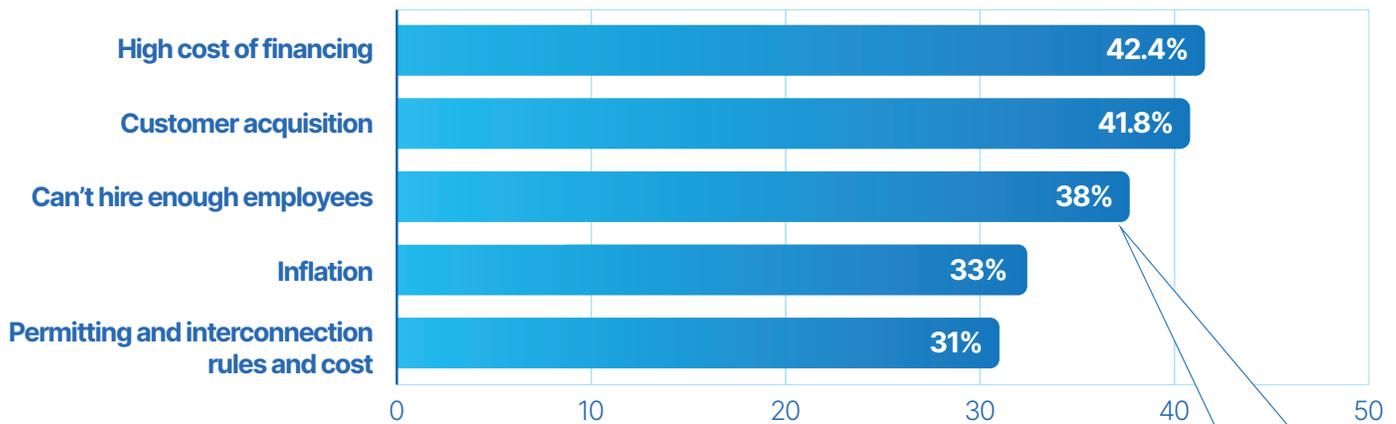
Respondents were asked about their success in 2022, and how they expected it to change over 2023. Overall, the outlook for the future is bright, but there are still a number of challenges companies expect to face.

Barriers to success

It's no secret that the solar industry faces some challenging headwinds, even as it expands. One of the biggest challenges is the increased cost of financing solar due to high interest rates and large dealer fees, which makes solar loans less attractive to homeowners.

Worker shortages just add to the pressure while permitting costs and red tape add on to the time needed to complete a job.

The solar industry's top barriers to success



Potential reasons that the industry is having a hard time hiring workers

Most in-demand skills:

1. Trained in solar installation - 71%
2. Trained in electrical work - 67%
3. Construction experience - 51%

Most prominent weakness in the workforce today:

1. Not enough skilled labor - 40%
2. Decreased desire to participate in work - 26%
3. Higher wage expectations - 18%

Attract workers by offering certification training

Solar workers who hold qualifications are an asset to solar crews. Certifications through the North American Board of Certified Energy Practitioners® (NABCEP) are among the most trusted by solar industry professionals and homeowners.

Respondents reported that 11% of their employees were NABCEP certified. Interestingly, 42% of installers said they require installation workers to obtain Continuing Education Units (CEUs) each year. Based on this, one might expect the number of workers with NABCEP certification to be higher.

74% of installers cover the costs of CEUs for their installer workforce, **signaling that these certifications are seen as an integral part of showcasing the credibility of an installation crew.**

Supply chain and inflation issues are impacting the solar industry

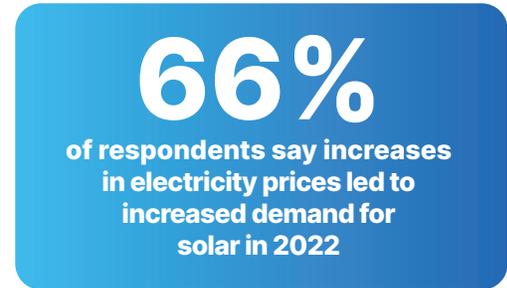
The scarcity of solar workers is just one of many problems stunting the sector. The supply-chain issues that dominated the headlines of 2020 and 2021 continued throughout 2022, and new complications with inflation and the cost of financing were cited as major concerns.

Top 5 challenges:

- Increased finance costs
- Inflation-related price increases
- Low equipment/materials availability
- Shipping time delays
- Withhold release orders

Severity of supply chain issues in 2022:

- 34%** Better than 2021
- 26%** About the same
- 41%** Worse than 2021



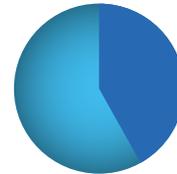
Increased demand for domestically manufactured products

But, these challenges could cause the industry to switch to more domestic products. **Since the passing of the Inflation Reduction Act, billions of dollars in new investments in stateside manufacturing have been announced.** The industry is taking note, but domestic supply chains aren't yet strong enough to meet demand.

U.S. solar manufacturing could see a boost

Almost half of the respondents said that supply chain issues have led them to purchase more U.S.-sourced products. **A total of 34% of solar installations in 2022 used products manufactured in the United States.**

Did supply chain issues lead to your company purchasing more domestically sourced products?

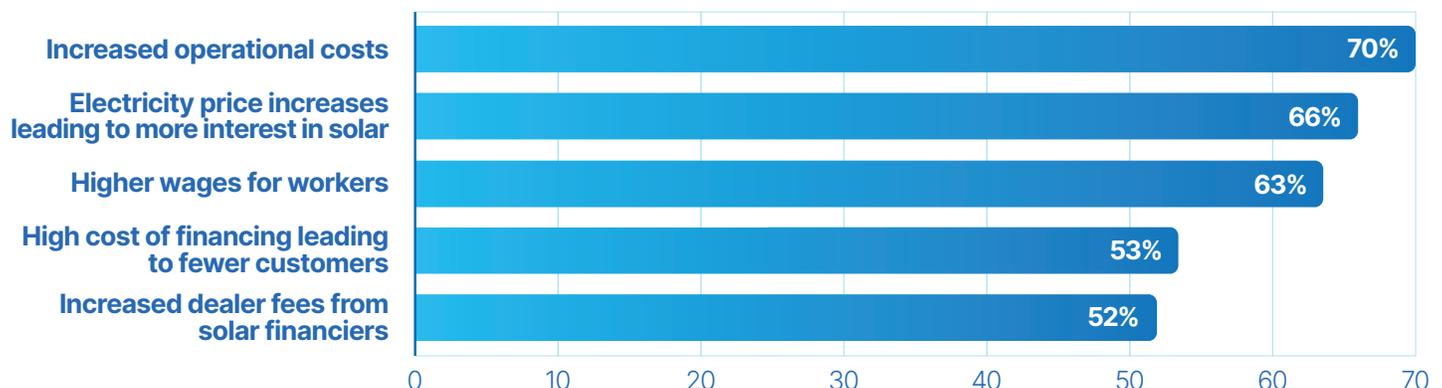


- Yes - 42%
- No - 58%

Effects of inflation

Inflation continues to be a challenge for solar businesses across the country, with higher operational costs being a top hindrance. **But inflated electricity prices are leading to increased interest in solar as homeowners look for ways to cut down on their utility bills.**

Effects of inflation on the solar industry



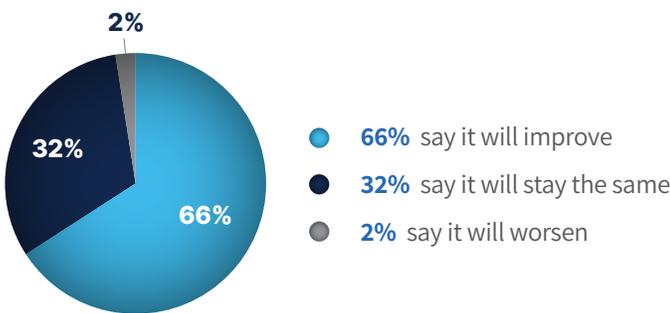
The Inflation Reduction Act & solar

The Inflation Reduction Act (IRA) promises to be the most significant financial investment in renewable energy technology in history, but it will take some time to realize all of its benefits. 62% of respondents believe the IRA will lead to their business expanding, but due to uncertainties in federal guidance while the Survey was being conducted, few could tell us exactly how they would take advantage of specific policies in the law.

We do have some compelling findings: In general, the industry feels that the IRA will increase customer interest in solar, but the current provisions haven't done enough to improve the ability to find qualified workers to serve those customers. Considering that 40% of companies said they couldn't find enough skilled labor, this could be a major pain point in 2023.

62%
of respondents believe the IRA will lead to their business expanding

How will the IRA improve customer interest?

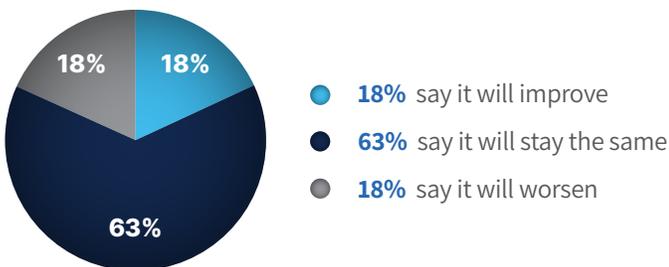


One of the most significant changes the Inflation Reduction Act introduced for the solar industry was the restoration and extension of the federal solar tax credit.

By upping the value from 26% to 30%, homeowners can now secure a higher tax incentive when installing solar panels. In turn, interest in home solar systems could increase.

The IRA revamped other incentives as well, such as the electric vehicle tax credit and the Electric Home Rebate Program. As the future becomes increasingly electric, more people will be seeking to cut their electricity bills, and what better way than by going solar?

How will the IRA affect the ability to find workers?



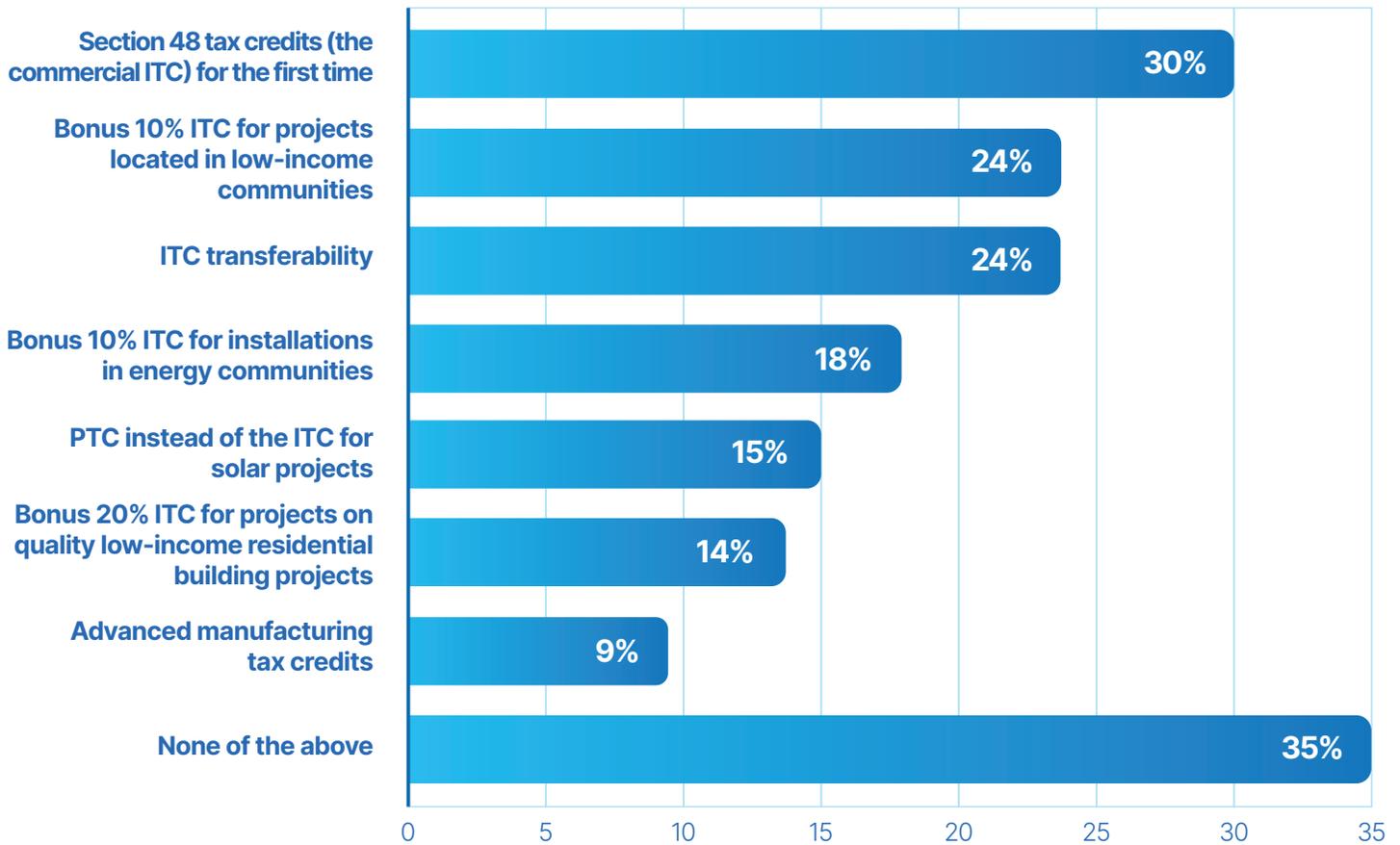
The IRA does not include specific job programs, but it does have prevailing wage and apprenticeship requirements that companies must meet to claim certain tax credits.

Despite lacking job or training program funding, the IRA is still expected to create millions of jobs, according to the Political Economy Research Institute at the University of Massachusetts Amherst.¹

2023 will likely be a year of tentative growth rather than rapid expansion as new workers are trained, and companies assess their ability to take advantage of new programs

¹ (<https://peri.umass.edu/publication/item/1633-job-creation-estimates-through-proposed-inflation-reduction-act>)

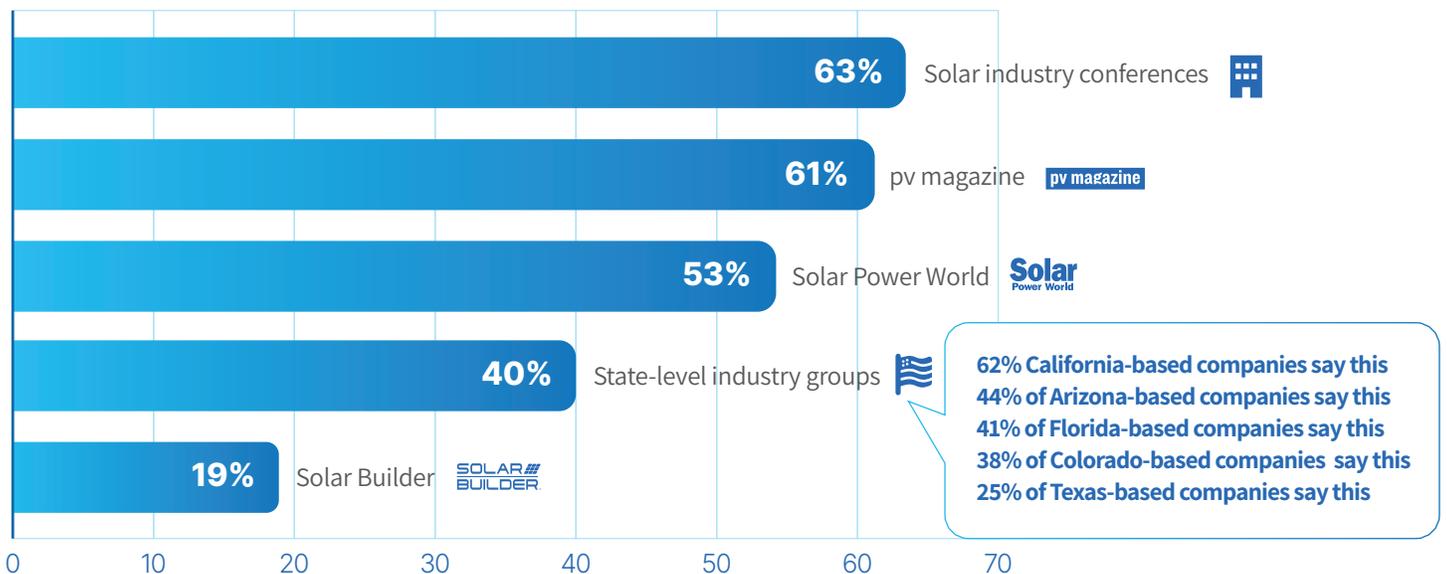
Aspects of the IRA respondents plan to utilize



How does the industry stay informed about the latest news?

As the industry faces challenges that are all too common for 2023, like inflation, hiring setbacks, and supply chain constraints, trusted news is imperative. According to respondents, the most trusted sources of information are:

Most trusted solar news source of the Solar Industry Survey respondents



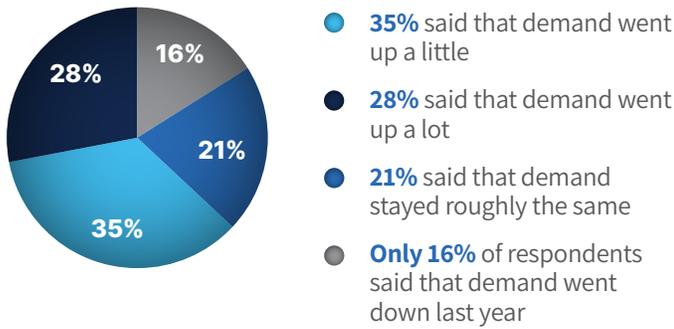
Residential and small commercial data

A majority of respondents work in the residential and small commercial sectors, giving us insight into customer demographics, product information, and the direction this part of the industry could be heading.

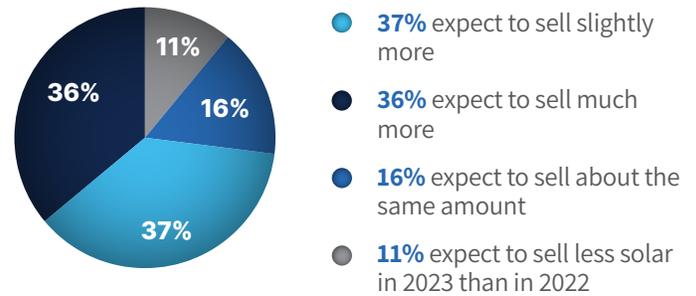
Demand for solar is expected to increase

The solar industry has continued to grow year over year, and installers need to stay on top of trends while monitoring barriers to success. The good news is that 63% of respondents saw increased demand in 2022. **The even better news is 73% of companies expect 2023 to be another year of growth.** What is standing in their way? Inflation, high-interest rates, and worker shortages.

Solar demand in 2022 vs. 2021:



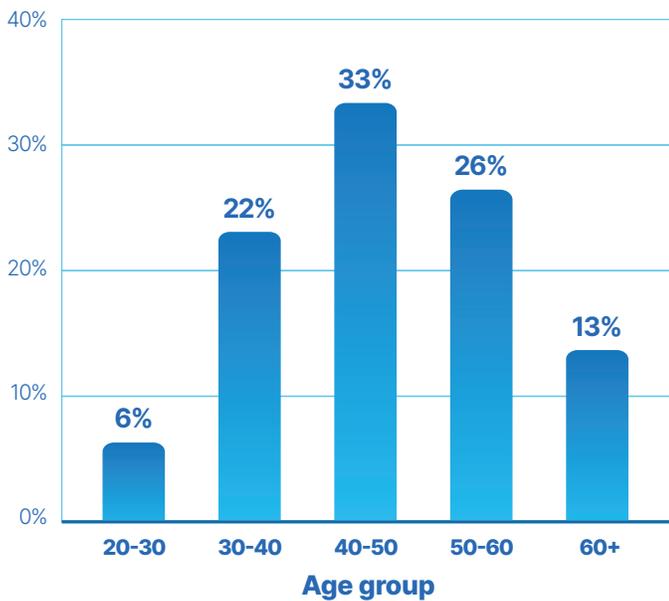
Expected solar installation sales in 2023:



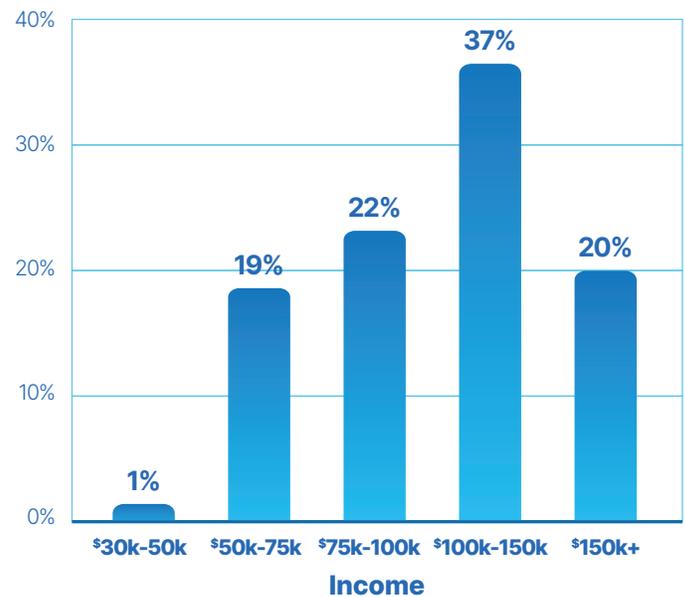
Who is getting solar installed?

Installers served a variety of homeowners. But, the responses received make it clear that the majority of jobs were for higher-income households, with 57% of installers reporting their customers' average income to be \$100,000 or above. Meanwhile, just 20% of installers report customers' average income to be less than \$75,000.

Typical age group of solar customers served in 2022



Typical household income of solar customers served in 2022



According to the installers in our Survey, the most likely solar customer is between 40 and 50 years old with an annual household income of between \$100,000 and \$150,000

Services offered

The solar industry has expanded over the years, with installers offering services beyond just solar panel installation. The most popular additional services provided by respondents were:

- Energy storage installation
- EV charger installation
- Electrician services
- Roofing work

15%
of installed systems were oversized to prepare for future EV charging needs

Battery storage installations are by far the most popular service offered alongside solar panels, with electric vehicle (EV) chargers a close second.



of residential installers offer energy storage installation



of residential installers offer EV charger installation

EV services don't stop at charger installations. Respondents reported that 15% of their installed systems were oversized to prepare for future EV charging needs. In addition, installers said 9% of their previous customers have requested additional panels for EV charging. We expect these trends to continue in the coming years as more homeowners prepare for future electric vehicle use.



The bottom line: solar storage and EV chargers are now the new standard. Installers who do not offer these services could fall behind the competition and miss out on high-paying jobs.

Additionally, a solar system cannot be installed on a roof in poor condition or without the work of an electrician, making it no surprise that solar companies also offer roofing and electrician services. However, the nationwide shortage of electricians, caused by a confluence of reasons, from decreased funding for training to a lack of electrical teachers, could spell trouble for the solar industry. We plan to track this trend to see if more electricians are being trained for the electric future.



of solar installers offer electrician services



of solar installers also do roofing work

Top solar brands

If price is no object, installers opt for brands that are proven to perform well, have a good warranty, and have a great reputation. These factors were most important to installers when choosing equipment:

- ✓ Performance and quality
- ✓ Brand name and reputation
- ✓ Product availability
- ✓ Warranty
- ✓ Aesthetics

What's not as important? Customer requests. On average, only 18% of customers request a specific brand of solar panel or inverter. **This is likely because customers rely on installers to be the experts. Few customers know about solar brands or their performance and rely on their installers to choose the best option.**

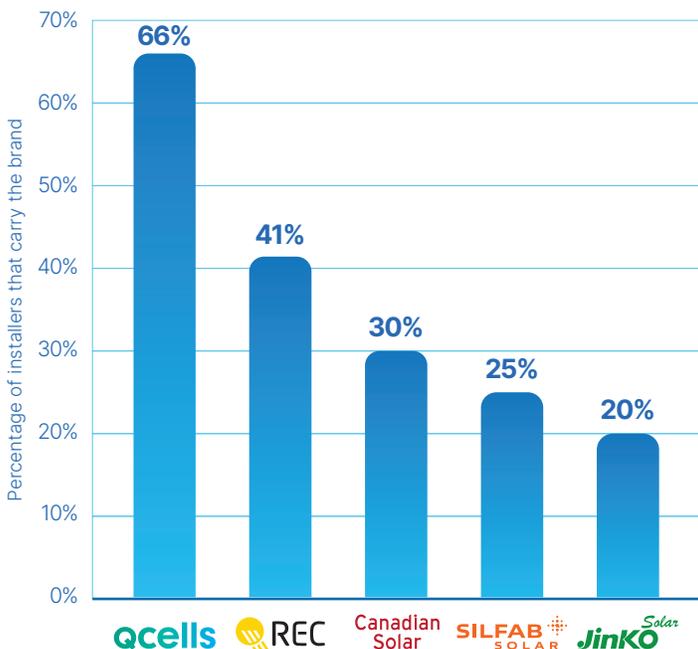
Top solar panel brands

In a year of supply chain disruptions, it was rare for solar installers to rely on a single brand of solar panels; 83% of respondents said they installed at least two brands, with an average of 3.6 brands per installer. Module prices were up, as 93% of installers reported paying more in 2022 than in 2021.

Qcells was the most popular solar brand in 2022, used by 66% of installers in our survey. With its recent announcements of stateside manufacturing expansions and domestic silicon sourcing, the Korean company looks poised to build on its already strong performance.

REC came in second this year, with 41% of installers offering its products. In total, 31% of installers offered both Qcells and REC products to customers. Rounding out the top five brands this year are Canadian Solar, Silfab, and Jinko.

Top solar panel brands



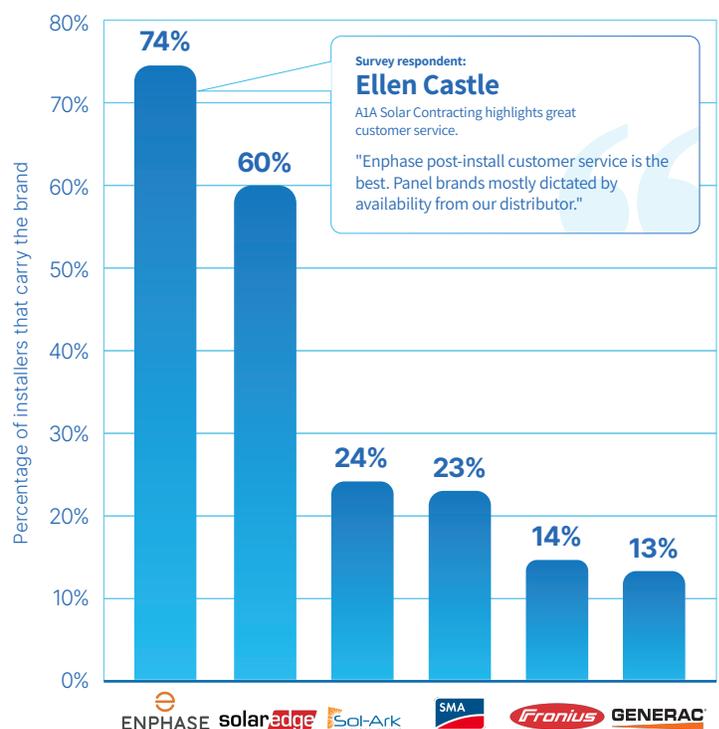
Top inverter brands

Enphase and SolarEdge have long dominated the inverter market, largely because of their compliance with National Electric Code (NEC) rapid shutdown requirements. **2022 was no different, with 74% of installers choosing Enphase and 60% going with SolarEdge. 44% of respondents install both of these top brands.**

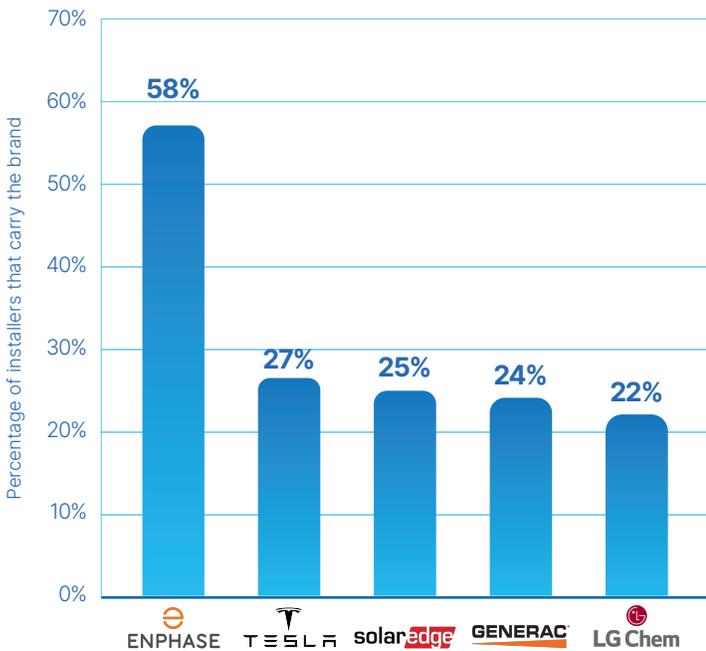
Although 75% of installers worked with at least two inverter brands, the rest preferred to stick with a single supplier. Of the quarter of the industry that only uses one brand, 58% are loyal to Enphase and 27% only offer SolarEdge.

Sol-Ark, SMA, Fronius, and Generac were also chosen by respondents but didn't come close to Enphase or SolarEdge.

Top solar inverter brands



Top energy storage brands



21%
of solar jobs were paired with energy storage in 2022

Energy storage is becoming more popular than ever, and one brand was the stand-out favorite among the rest - Enphase.

58% of respondents offer Enphase battery installations, while only 27% offer the Tesla Powerwall, despite its brand recognition. Although this may seem surprising, it's only natural that installers who trust Enphase for inverters would also choose its batteries.

SolarEdge, Generac, and LG Chem follow close behind Tesla.

Demand for battery storage will increase

Respondents reported that 21% of all solar jobs in 2022 included energy storage, and 5% of jobs consisted of adding batteries to existing solar installations. Battery installations were highest in the following states:



30% of jobs in Florida were paired with batteries



30% of jobs in California were paired with batteries



27% of jobs in Texas were paired with batteries

Batteries will likely continue to rise in popularity due to three converging events:

1. Restrictions on net metering
2. Increases in utility costs
3. More frequent grid outages

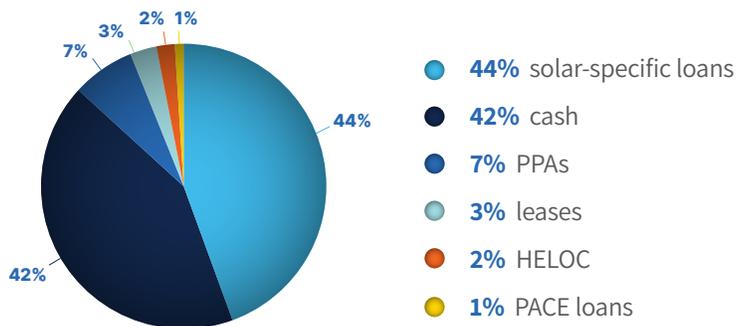
One of the biggest factors driving an increase in energy storage deployment is that net metering, the billing structure that allows homeowners to be compensated for excess energy their solar panels produce, is being gutted across the country. Batteries allow for excess energy to be stored, not sent to the grid, so that homeowners can get the full value out of their solar energy. Coupled with increased utility costs, a battery can now save solar homeowners much more than it did in the past.

Another reason interest in energy storage is rising is an increase in the frequency and duration of power outages. Homeowners want to have access to backup power as they experience blackouts with more regularity, and batteries can provide just what they're looking for. This is why it's not surprising to see Florida, California, and Texas as the states with the highest percentage of battery installs, as they've all been experiencing widespread grid outages in the past few years.

Solar financing

In the past, third-party-owned solar systems through leases and PPAs constituted a majority of installations. As solar became more affordable, solar loans took over as the top way to finance home solar projects. The findings of this year's Survey tell a surprising story about residential and small commercial installations - while loans are still the top way to finance solar installations, cash purchase aren't far behind:

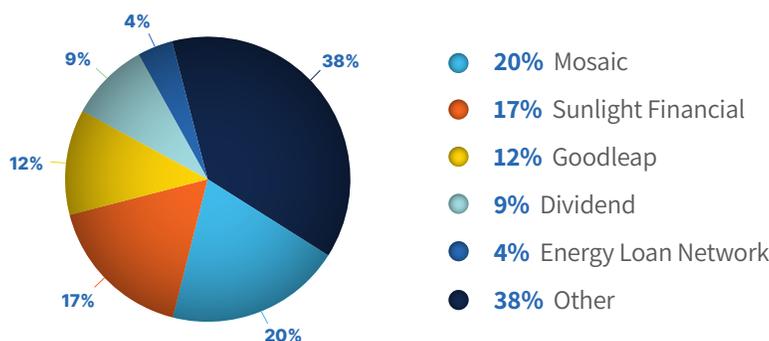
Rising interest rates are making solar loans less attractive to homeowners.



71% of installers reported that customers were less likely to take a solar loan in 2022. Rising interest rates and dealer fees from major solar loan providers may be at fault. These issues persist in 2023 and will likely cause the solar financing landscape to continue to shift.

Top 5 solar financing companies used by installers

Though customers are more hesitant to take solar loans, 79% of respondents say they continue to work with financing partners, mostly among these top loan providers:



Installers were also asked a subjective question about the best financing offer that was available to them in early 2023. Respondents reported the following averages:

- **25-year term**
- **5% APR**
- **20% Dealer fee**

Installers with access to credit unions like UMassFive and Clean Energy Credit Union could get better loan terms of between 12 and 25 years and rates from 4.5% to 8.9%, with no dealer fees. But those loans are available to a limited subset of the U.S. population.

Due to the current high cost of financing, third-party ownership may become more desirable from a consumer perspective. Solar lease and PPA payments and savings may start to outweigh solar loan options if dealer fees and APRs continue to increase.

Recall that 30% of installers reported they would take advantage of the Section 48 investment tax credit for the first time in 2023, suggesting more companies may branch into lease and PPA offerings. We'll be following up with these installers as part of next year's survey to see if there is a change in the prevalence of third-party ownership.



About SolarReviews

SolarReviews is America's leading independent website for solar leads for installers, consumer reviews, and comparisons of solar panel installation companies and residential solar panel brands for homeowners. They offer consumer and expert reviews, specifications and warranty details, panel prices, and quote comparison tools that streamline the solar installation process and make it easy for homeowners. For more information, visit <https://www.solarreviews.com>.



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About NABCEP

The North American Board of Certified Energy Practitioners[®] (NABCEP[®]) is the most respected, well-established, and widely recognized certification organization for professionals in the field of renewable energy. NABCEP offers certifications and credentials for skilled professionals, specialists, and those new to working in the areas of photovoltaics, solar heating, and small wind technologies. The first NABCEP Solar PV Installer certification exam (now called PV Installation Professional) was administered in 2003. Since then, NABCEP has launched and maintained 8 Board Certification Programs and 3 Associate credentials.

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