

RESIDENTIAL ROOFTOP REPORT

VOLUME 1 • 2018

FLASH REDUCTION

How this 'micro' change leads to big
solar installer savings

A SUPPLEMENT TO

**SOLAR
BUILDER**

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INSIDE:

- Residential solar outlook for 2018
- National installer declines?
- Tips for railed design
- Three customer service tools

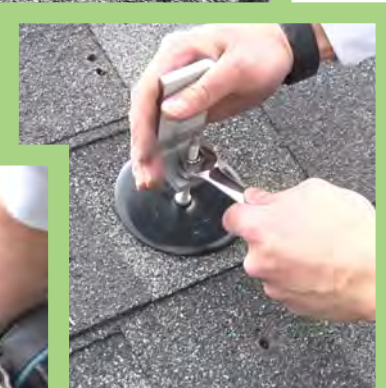
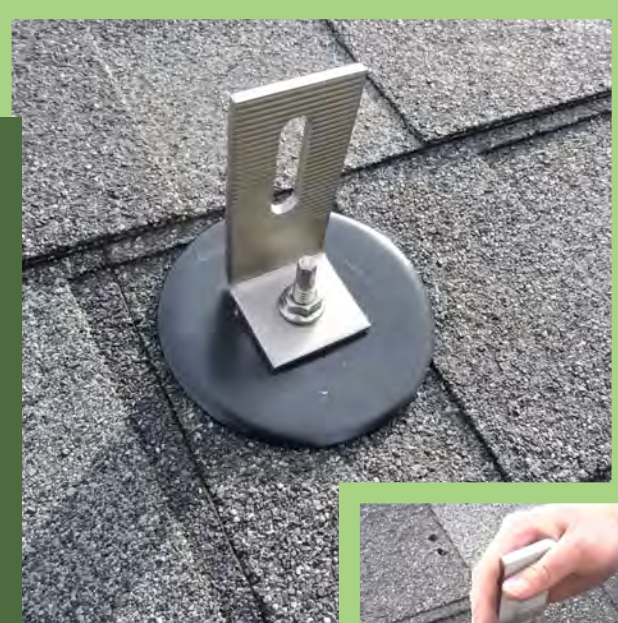
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Our line of UL Certified QuickBOLT Mounting Systems with Microflashing™ does just that. With less components than our competitors and a faster install time, the QuickBOLT will make your job easier while saving you money.



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THE SUN will come out

Four positive trends for residential solar contractors in 2018

By Chris Crowell



We start 2018 with a tug of war for the short-term future of the solar market — a rocketed demand curve bolstered by lower costs versus an artificial increase in some of those costs because of the Suniva/Solar World trade case. The uncertainty for the overall industry is a bummer. The good news? We think the tea leaves continue to favor the local and regional residential solar installer. Here are four reasons why.

1. National installers are on the decline

This one is going to start out on a down note, but we see opportunity in it for your business. The Q3 2017 U.S. Solar Market Insight report from GTM Research and SEIA showed a 10 percent decrease in the residential PV sector quarter-over-quarter.

“The year 2017 has been unconventional for solar in the sense that utility and residential PV, which have historically been the market’s major growth segments, are actually expected to decline in 2017,” said GTM Research Solar Analyst Austin Perea.

The report attributes the slowdown to two key factors: persistent nationwide customer acquisition challenges and a pivot by major solar installers that are pursuing profitable sales channels over growth. This has been particularly acute in mature markets that account for the majority of installation volumes.

So, while the decline in installations indicates a slowing of the residential sector, it only indicates to us a shifting in the market away from the dominate national business model and volatile business strategies. Consider that NRG Home Solar, Sungevity and Direct

Energy Solar went bankrupt or left the sector in 2017. SolarCity, on the other hand, which was starting to lose steam with its leasing model, started focusing more on profitability than capacity expansion and shifted to selling loans.

While SolarCity slowed down leasing systems, Sunrun has stayed the course, so much so that it surpassed SolarCity around the third quarter of 2017. From the report:

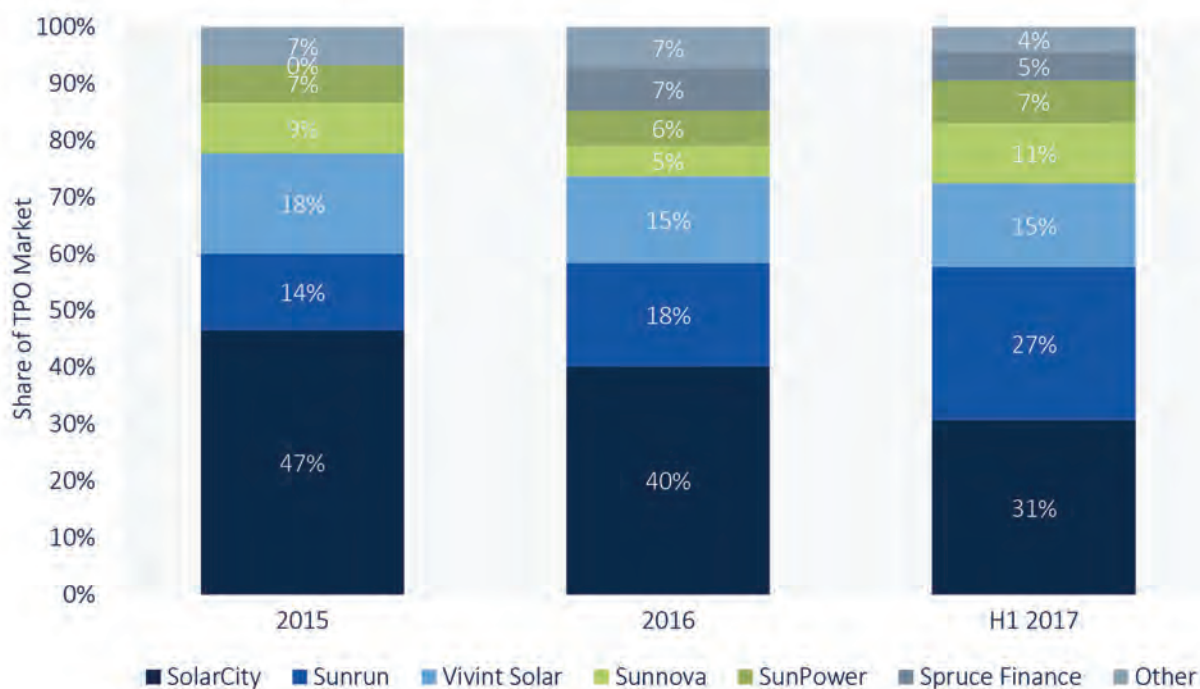
“Through the first half of 2017, Sunrun narrowly missed the top spot in the TPO market with 27 percent market share, just behind SolarCity’s 31 percent share and up considerably from its 18 percent share in 2016. That difference of 4 percent market share between SolarCity and Sunrun equated to just 19 MW over two quarters. And in Q3, Sunrun financed 80 MW of systems, while SolarCity financed no more than 59 MW (a ceiling, as some of SolarCity’s systems were from its commercial business), a difference in Sunrun’s favor of more than 20 MW.”

Sunrun also doesn’t need to cut costs in the same way as SolarCity because of its strategy of using a vetted dealer network to install systems.

Despite that success, don’t bet on leases as a long-term play. GTM Research says leases will make up just 37 percent of the residential market in 2017 as compared to 53 percent in 2016.

Customer acquisition is a huge expense, as you know, but such costs are especially unwieldy on a national scale, and as the early adopter markets have matured, the returns start to not match the investment. Just because companies like SolarCity and Vivint have scaled back operations in some of these markets, citing them as unprofitable, doesn’t mean they are unprofitable for smaller, nimble solar contractors. Again, from GTM:

TPO Provider Market Shares, 2015-H1 2017



“While the companies make better margins off their TPO products, years of selling leases and PPAs (where the companies receive payment from the customer over a 20 year term) have left both companies in dire need of cash in the near term. Cash and loan sales allow the installers to realize immediate payment for systems they install.”

2. Residential solar can survive tariffs

Yes, there will be an artificial dampening of the solar market as a result of the trade case outcome, whatever Trump decides. Just the whiff of tariffs back when the petition was filed in April 2017 caused module prices to increase, which means the cost to install solar increased for the first time in years.

GTM estimates that the net impact to its base forecast could range from just 9 percent under a 10¢/W tariff to 48 percent under a 40¢/W tariff. So, not optimal, but much of that will be in the utility-scale solar sector. The residential solar market this year, regardless of tariff conditions, should be OK, although it may be state dependent.

“Every segment, in every state, will be unique,” GTM notes. “In the residential sector, the biggest volume impacts would be felt in the largest state markets, but nascent states that have just begun to develop vibrant residential solar sectors could disappear almost entirely.”

Now, we aren’t ones to disagree with GTM’s models, but we do think some nascent states in the Southeast and Midwest, thanks to a more certain regulatory and pricing environment, have protected themselves from “disappearing almost entirely.”

The number of states growing their solar capacity is, well, growing. Emerging markets in the Southeast, like Florida, Mississippi, and South Carolina were all forecast to install more solar in 2017 than any year previously. Texas installed more solar in the third quarter of 2017 than

the state installed in the entirety of 2015. Even in the down 2017 third quarter, several markets actually experienced record quarters for the residential solar segment, such as New Mexico, Washington, D.C., Virginia and Idaho. Florida and Pennsylvania surpassed 50 MW of residential capacity for the first time ever in 2017.

The overall U.S. numbers can dip when the larger, saturated markets have a few down quarters, but in terms of sustaining the whole — the mass of small businesses across the country that can install solar profitably — the developing market rise is a better indicator to us.

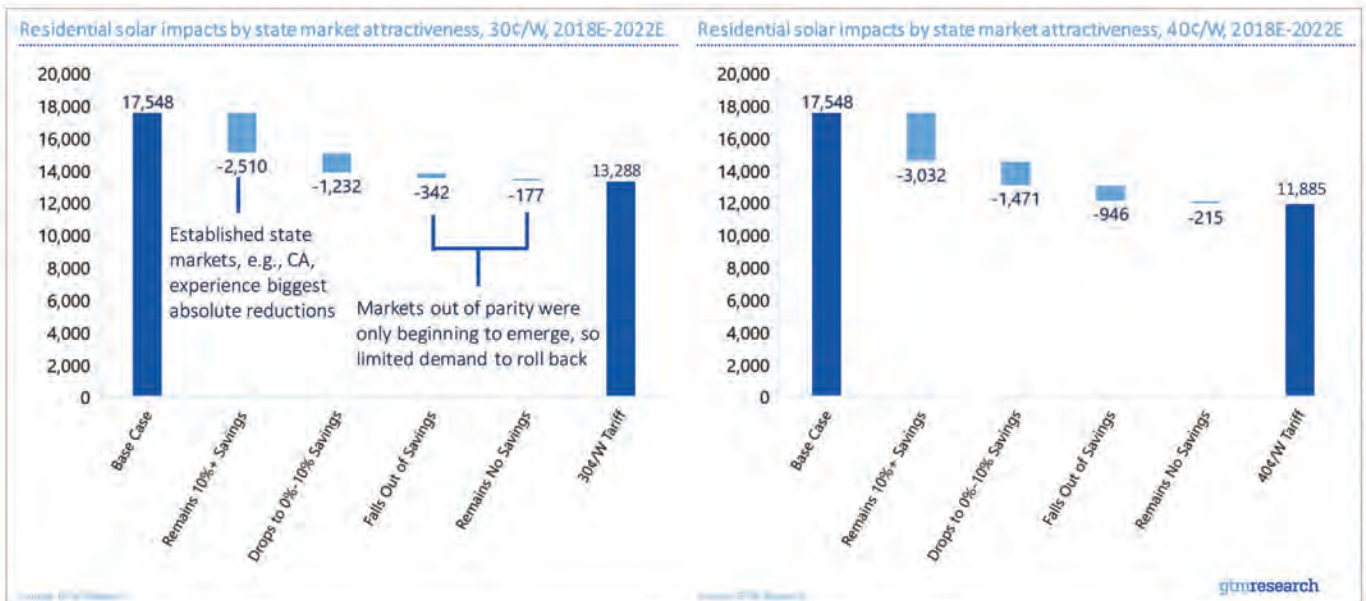
3. The opportunity is here to stay

Of all the forces vying for solar’s soul, this is most important to us: The huge demand driven by economic sense and environmental concerns. First consider the sheer mass of potential. Sun Number and Wave Solar have run the numbers and say that 84 million homes on Zillow show the potential for solar using the Sun Number dataset analysis.

“Home sellers and buyers that have not had Sun Number scores previously have been contacting us asking how they can get a Sun Number score for their home,” said David Herrmann CEO of Sun Number. “The expansion of Sun Number scores to 84 million residential buildings on Zillow means many of those homeowners, sellers and buyers have a simple way to access this useful information.”

Combine that with a truth that gets glossed over in the debate over how much or how little to incentivize solar energy as part of our energy future: people actively want it.

“People are motivated to buy solar because of the dramatic cost savings,” explains Carly Fink, principal, head of strategy and research, Provoke Insights. “The cost of residential solar to consumers has decreased by 40 percent over the past 5 years, making the decision to go solar completely viable for an increasing number of homeowners.”



THE SUN will come out

4. Jobs still matter

Real talk: Solar is the only industry with the capability of creating hundreds of thousands of new jobs. The tech industry, as important as it is, doesn't employ the number of people equal to its size of influence (usually removing jobs from the overall workforce in aggregate). The U.S. solar industry, on the other hand, is a sea of job opportunities. No number of tariffs are going to turn around climate change, the inefficiency of coal, the instability of natural gas price swings or even the general lack of growth industries in today's economy. This gives it, pardon the pun, power.

The Bureau of Labor Statistics says "solar installer" will be the fastest-growing job in America over the next decade. As the U.S. economy adds a projected 11.5 million jobs over the next decade, solar installer jobs will grow by 105 percent — more than any other occupation.

The number of solar jobs increased in 44 of the 50 states in 2016, showing that solar industry growth is truly a nationwide phenomenon. The state with the highest total number of solar jobs in 2016 was California, followed by Massachusetts, Texas, Nevada and Florida.

There are also more avenues for joining the industry and for finding interested employees. The Solar Training Network, for example, launched an online solar career platform at SolarTrainingUSA.org, which provides career resources for solar job seekers and connect solar trainers and employers to qualified applicants.

So: Demand, opportunity and an environment that favors local jobs. Don't let the broad headlines on total solar capacity and tariffs fool you: the future is still bright for residential solar installers. 🌞

Chris Crowell is the managing editor of *Solar Builder*.



The Bureau of Labor Statistics says "solar installer" will be the fastest-growing job in America over the next decade.

The 2017 Residential Solar Industry Study from Provoke Insights surveyed 2,666 consumers nationwide and specifically examined consumer attitudes about purchasing solar power.

- 41 percent of those surveyed say that the primary reason for choosing solar is potential savings over time and protection against rate increases from the utility company.
- More than half of solar users say that 75 percent of their electric bill is covered by solar.
- Political party affiliation does not dictate the choice to switch to solar.
- Regarding aesthetics, roof orientation is a concern for 70 percent of solar energy users; panel aesthetics are a concern among 63 percent of women vs. 59 percent of men.
- 66 percent of solar energy users would install a solar energy system again if they moved to a different house.
- 50 percent of consumers will choose a solar provider based on the recommendation of a neighbor or friend.
- Consumers use three primary payment methods to go solar: Paying cash (36 percent), financing with a lease (36 percent) and financing with a solar loan (28 percent).

*Stats courtesy of
the Q3 2017 U.S.
Solar Market Insight
report from GTM Research
and the Solar Energy
Industries Association
(SEIA).*

10%

That's how much the residential PV sector fell quarter-over-quarter in Q3 2017. Declining growth is driven by weakness in California and major Northeast markets, which continue to feel the impact of pull-back from national providers.

**11.8
GWdc**

That's how much new PV GTM Research estimates will come online in 2017, down 22% from a record-breaking 2016. The forecast has been adjusted downward from 12.4 GW last quarter to reflect continued challenges in the residential market and a push back in utility-scale completion timelines due to uncertainties surrounding the trade case.

4 GW

That's how much utility-scale PV is currently under construction across the nation, and GTM Research forecasts an additional 3.9 GW will come online by year-end 2017. This would make 2017 the second largest year ever for solar installations behind only the record-shattering 2016.

2,031 MW

That's the amount of PV installed in the U.S. in the third quarter of 2017 — the eighth consecutive quarter that the solar industry added more than 2 GW. The capacity additions represent a 51 percent drop year over year.

22%

Get this: That's how much non-residential grew year-over-year, installing 481 MW in Q3. Non-residential consists of commercial and industrial businesses that install solar, nonprofits and community solar programs. California, Massachusetts and New York all posted strong quarters while Minnesota had its largest quarter ever due to its robust community solar program. Nationwide, community solar capacity is on track to grow by more than 50 percent year-over-year.

22%

That's how much the industry is down compared to the third quarter of 2017, which is in line with the expected 21% decline for all of 2016 vs all of 2017.

51%

That was the utility-scale segment's piece of the installed capacity pie in Q3 2017. The utility-scale segment was led by Nevada, North Carolina and Texas. In fact, Texas installed more solar in the third quarter of 2017 than the state installed in the entirety of 2015. Meanwhile, emerging markets in the Southeast, including Florida, Mississippi and South Carolina all had strong quarters and are forecast to install more solar in 2017 than any year previously.

By
The

NUMBERS



Flash Reduction

How this 'micro' advancement in flashing adds up to big savings for solar installers

By **Jared Wiener**

Flash Reduction

As a second-generation owner of a fastener import company, I learned long ago that screws just aren't sexy. They're necessary for all woodworkers, but rarely do people get excited about the latest innovation in screw technology. Within the residential solar industry, flashing is the unsexy cousin of screws. Every solar installer must find a way to prevent the roof from leaking, but most are either unaware or too busy to know what's happening in flashing technology. This isn't surprising, due to the fact that flashing typically makes up less than 5 percent of the total cost of a standard 7-kW install on an asphalt shingle roof.

As our industry continues to look for ways to reduce costs, successful companies will emphasize reducing labor costs over the raw cost of materials. In the past, installers could save money on flashing methods, but at the expense of security. Today, installers who are looking for ways to reduce costs without sacrificing security can look to the latest innovation in flashing technology: Microflashing.

Why flashing matters

Holes must be made in the roof for a solar installer to mount the array. Those holes must be sealed in some manner, otherwise the roof could leak. An installer who doesn't use proper flashing methods greatly increases their risk of being held liable for a leaky roof. Plus, International Building Codes require flashing to be used on residential rooftop solar. Because flashing is usually sold as part of the mounting system, mounting manufacturers design flashing products that, first and foremost, prevent leaks. Factors like ease of use or install speed often came second.

However, at SolarRoofHook, we sought to improve upon the various flashing methods out there with one goal in mind: design a flashing product that would prevent water from entering the penetration while reducing the installer's time up on the roof. So, our marketing team researched various types of flashing methods for asphalt shingle roofs to identify a common problem.

Evaluating alternatives

For decades, installers have used similar flashing technology for asphalt shingle roofs. The earliest form of a flashing product we could find was a large rectangular piece of aluminum that installers would slide underneath the shingles and over the hole to direct water runoff away from the roof penetration. The product is lightweight, which makes it easy to carry up to the roof. Finally, because of the malleability, installers grew used to making adjustments on the roof easily, for example cutting the flashing. This was the first flashing product we launched for asphalt shingle roofs at SolarRoofHook, called the Flashed L-Foot.

But over time, as solar became more prevalent in other areas of the country, particularly areas with higher wind speeds, the malleability of aluminum became a problem. In the 1980s, manufacturers began producing a more rigid flashing made of galvanized steel. These products didn't bend or misshape from heavy winds, expanding the options available to installers throughout the U.S.



Thirty years later in the late 2000s, minor innovations in flashing technology took place as mounting manufacturers began shifting away from “standoff” type mounts and toward mounts that integrated flashing into the design. Both rubber bushing flashing and elevated flashing were designed to add an extra layer of security to protect against water entering the penetration. A rubber bushing (usually EPDM) is inserted into the opening of an aluminum flashing where the roof penetration is made. When the mounting hardware is driven into the flashing, the rubber bushing creates a watertight seal around the mount. Elevated flashing offers additional security by featuring a raised section above the roof penetration, forcing water *around* the hole instead of directly over it.

Designing a better flashing method

These four flashing designs have been the primary methods used across the country for the past three decades. After speaking with installers, our team identified three common problems that installers face on the roof related to using flashing: size of the flashing, number of components, and speed (time it takes to install).

Most of the flashing products used in the past included 12”x12” pieces of metal to cover a hole that is typically only 5/16” in diameter. Installers ended up cutting the material to fit according to their array or simply to remove excess metal. We did find that some installers were willing to pay for the large size because they were able to cover

Flash Reduction

up any other holes made on the roof, for instance, when an installer might miss the rafters when pre-drilling or driving mounting screws.

In the early days of residential solar, aluminum flashing products consisted of only a few components: the metal flashing piece, an L-Foot, and one or two mounting screws. As more manufacturers began integrating the flashing with their mounting products, the number of components grew. Most of the rubber bushed flashing and elevated flashing products we researched consisted of more than five individual parts, often including numerous small washers and nuts. The problem many installers face dealing with so many individual components is simple: they are easy to lose on the roof. Many professional solar installers wear gloves, so it is difficult to manipulate all these small parts — and if one falls off the roof, good luck finding it.

As the number of components increased, so did the installation time. According to the installers we interviewed, what used to only take a couple minutes — to apply sealant to a piece of aluminum flashing, pre-drill a hole, then drive the screws — could take up to 30 minutes for a single flashing product. Our design team prioritized this problem when developing Microflashing because of the direct link between install time and profits for solar installation companies.

Microflashing explained

In 2010, we launched our patented QuickBOLT Mounting System for asphalt shingle roofs and what we have now termed Microflashing. The design of the system addressed the problems installers were facing: size of the flashing, number of components and speed.

The Low-Profile QuickBOLT consists of only three components: a 3" stainless steel-backed EPDM rubber compression washer called Microflashing, a 5.25" hangar bolt with a Type 17 point and unique collar, and a 5/16" serrated hex flange nut. When installers drive the bolt down, the collar compresses the Microflashing down onto the roof, creating a watertight seal. Any racking system can then be mounted by connecting a T-bolt to the L-Foot. Installers have fewer components to worry about losing and can install the system in less than 60 seconds. The Microflashing is large enough to cover any other holes that might be made from missing the rafters, but unlike traditional flashing methods, installers no longer have to pay for extra, unused material.

What separates Microflashing from previous flashing methods is its placement. Before, installers would lift up the shingles and slide in the flashing underneath. Not only is this time consuming, but it voids the roof warranty and increases the installer's risk. Instead, Microflashing is designed to be placed directly over the shingle. Water is redirected around the washer just like other flashing methods — but it is significantly easier for installers to use.

This innovation in flashing methods has given installers a new way to install more solar and increase profits. In an ever-changing solar market, especially with the Trump tariff decision, installers are looking for any way to be more cost effective. Microflashing is just one more innovation that makes solar more affordable for all. 📈

Jared Wiener is Executive Vice President at SolarRoofHook.

The QuickBOLT system



The Low-Profile QuickBOLT consists of only three components:

1. 3" Microflashing (stainless steel-backed EPDM rubber compression washer)
2. 5.25" Hangar Bolt with a Type 17 point and unique collar
3. 5/16" Serrated Hex Flange Nut



The Microflashing directs water away from penetrations while still being a compact final product. QuickBOLT is Patent #8448407.

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Quick tips on:

ounting with Rails

1

For starters, it is easier to start. Rails involve a lower learning curve, and you can get a crew trained on system installation fairly quick, and part of the reason for this is a more forgiving layout. On a straight-forward roof, your layout time is reduced. “All rackless systems don’t use rails. That’s a time savings, but if the number of attachments is higher, if the parts costs are higher, or if there are still fiddly little parts that need adjustment, the overall costs are higher — not lower,” says Barry Cinnamon, founder of Spice Solar. “Installers should carefully account for all parts, including roof attachments.”

2

Simple on the right roof. Railed racking is ideal for large, simple array layouts or a crooked roof. Look for low to moderately pitched roof applications in the 8 to 44 degrees range. Railed systems will require more engineering on steep slope pitched roof applications, 45 degrees or greater.

3

Streamlined design. Some of the benefits aren’t inherent in the general rail system, but have been built in to select products, such as systems that eliminate the need for clamps on the roof, which increases the speed of installation and saves 20 to 30 percent in labor time.

4

Rails can be shared, too. Shared rail solutions use a rail to hold the modules in place, but reduce components elsewhere, such as mid and end clamps. Shared rail systems cover the entire side of the module, and the module frame becomes bonded to the rails and reduces the strain on the module. Because the rails are shared, a two-up installation would require only three rails as compared to four for a standard mid and end clamp system. This provides its own unique nimbleness for either landscape or portrait installations on all roof types. Shared rail also requires fewer roof penetrations, lessening the potential of a “floating” penetration.

What's New?

Three tools to improve your customer service in 2018

1. Smart home devices.

Often, the biggest hurdle for selling solar is a lack of understanding by potential customers. But smarter homes are starting to make the general public more aware of their energy use, which is also a helpful nudge toward selling solar systems. Smappee Plus is the coolest device for this that we've seen. It measures real-time energy use from household appliances, offering valuable insights into a homeowner's energy use and production. Smappee Plus is the only energy monitor that combines load disaggregation with submetering technology to provide real-time data also for appliances with variable output — such as air conditioning, electric vehicles, heatpumps, etc. Consumers are able to see how much energy a device uses and its daily, monthly or annual energy costs. Owners can then make informed decisions on their energy consumption (e.g. when to buy a more energy efficient fridge) and act to save on energy costs and efficiency.

Smappee Plus is also the only energy monitor that you can program to take on the role of an “energy traffic controller” in the home. The product can automatically steer excess energy production, such as solar power, to appliances in order of preference, further increasing a homeowner's energy efficiency and cost savings. You can choose from numerous “recipes” that automate certain actions.

2. Stronger protection.

Two stigmas to address here: 1) The worries of some customers (especially in a market like Ohio) of relying so much on

the sun for energy when it feels like it's cloudy all the time. 2) The reality that some solar systems are installed with subpar quality equipment that either underperforms or fails but can't be replaced because the company that provided the warranty went out of business.

One defense is always installing quality equipment by trusted brands with solid warranties. Another new concept is looking to third parties that guarantee performance for the lifetime of a PV system. Omnidian, for example, is a nationwide provider of comprehensive protection plans for investments in residential solar systems. Omnidian's performance guarantee includes 24/7 continuous monitoring, proactive service alerts and 100 percent covered hardware and software through a nationwide network of field service professionals, as well as 100 percent guarantee of promised energy or plan owners will be reimbursed for energy loss.

Omnidian's proprietary technology integrates with all major third-party monitoring platforms and quickly identifies underperforming assets requiring field service dispatch. The firm partners with a nationwide network of pre-certified field technicians. Omnidian's 100 percent performance guarantee transfers solar energy production risk away from the asset owner. This risk transfer secures the solar energy investment, enhancing asset security and liberating capital.

3. Streamlined payments.

Solar contractors are in a constant battle against soft costs, so every gain in efficiency helps. Frequently installers have

disparate and fragmented systems in place for their billing and payments that increase the cost of their cash and require high degrees of financial and IT labor. Operationally, these legacy systems often mean solar businesses are taking a combination of expensive credit cards (fees of 3 percent or more), manually intensive bank payments and a staggering number of paper checks that delay cash settlement. Rarely do these payments tie back to the financial systems or the POS/invoices, so manual labor and reconciliation end up introducing needless costs in lost productivity and customer maintenance.

In 2018, consider a new cash management process: from accounting software, to invoice, to receivables, to payments, to settlement, to reconciliation. PayStand is one such cloud payment suite. With PayStand, solar distributors, manufacturers and installers can take payments across multiple channels such as PayStand's 0 percent network, as well as echeck bank transfers and wholesale ACH and card transactions, all in one system. Further, PayStand works directly with invoices, automating financial processes alongside accounting software, and adds powerful management and reporting capabilities.

PayStand has recently added Allterra Solar, Geoscape Solar, Gunthers and Simplify Solar to its ranks of solar customers. With PayStand, these new customers are enjoying many benefits, including: faster time to cash, a frictionless customer payment experience, automation and improved billing efficiencies and significantly reduced transaction costs. ■■■

UL CERTIFIED ASPHALT MOUNTING SYSTEM



LOW-PROFILE QUICKBOLT

4" MICROFLASHING™
FOR WIDER COVERAGE

WITH MICROFLASHING™ TECHNOLOGY



Patent # 8448407



100% LEAK-PROOF ASTM E331 & E2124



INSTALL IN LESS THAN 60 SECONDS

25
YEAR

25 YEAR WARRANTY



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