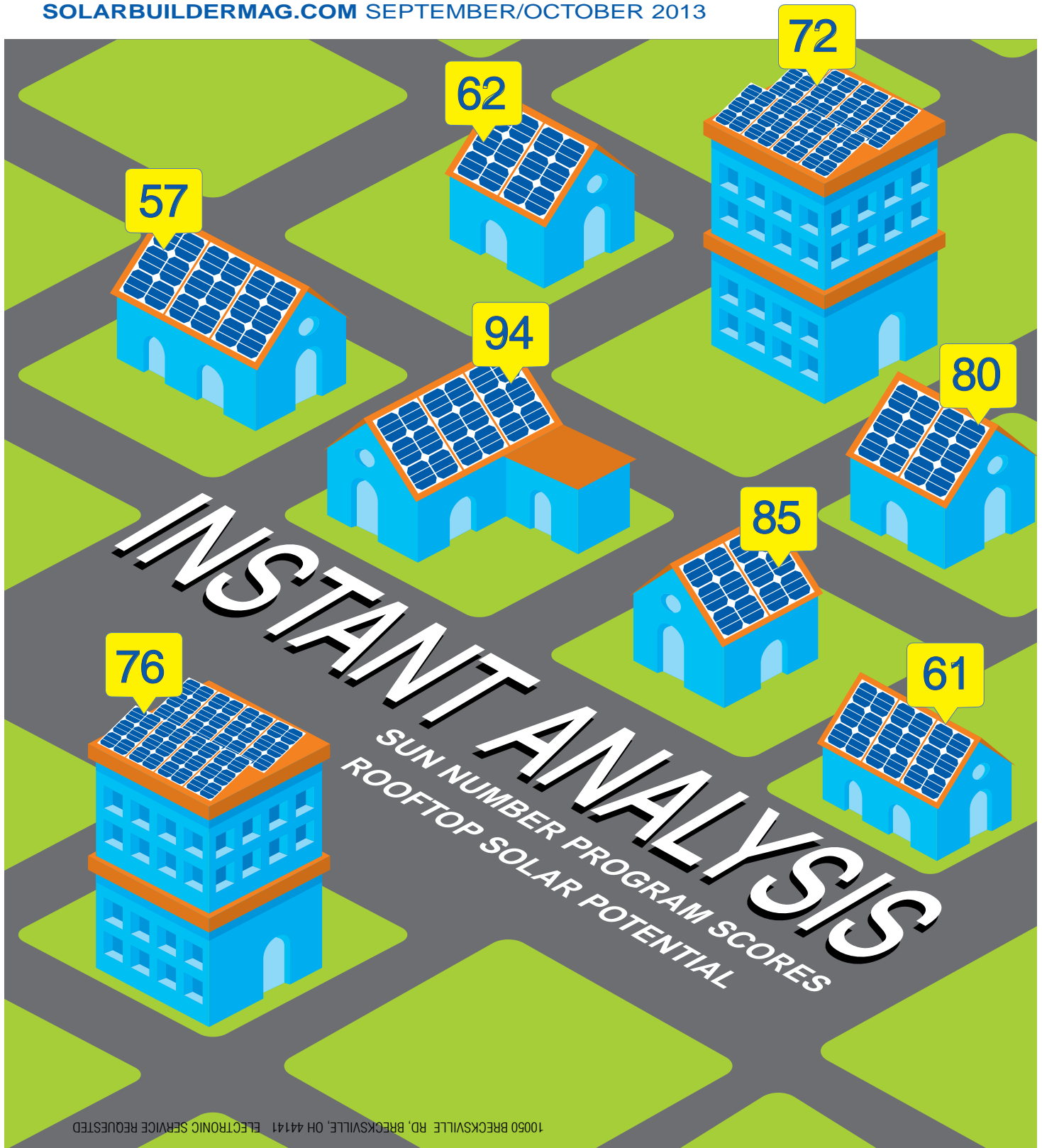


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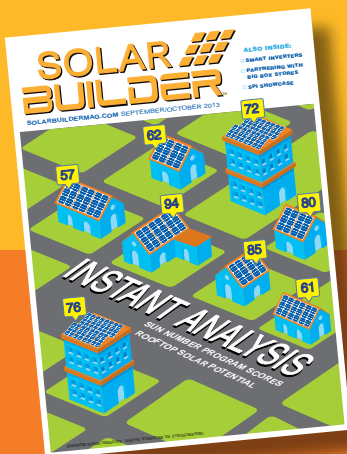
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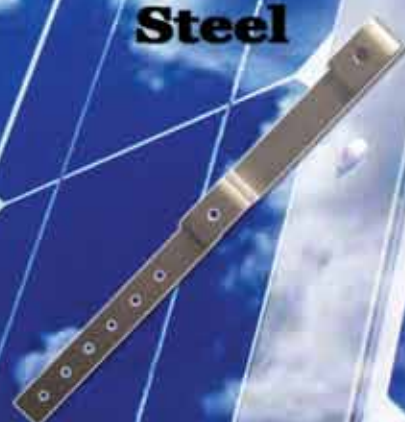


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Kelly Pickerel

Kelly Pickerel, Associate Editor

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POSTMASTER: Send address changes to *Solar Builder*, 10050 Brecksville Road, Brecksville, OH 44141 USA

CANADIAN SUBSCRIPTIONS: Canada Post Agreement Number 7178957. Send address change information and blocks of undeliverable copies to Canada Express; 7686 Kimble St., Units 21 & 22, Mississauga, ON L5S 1E9 Canada.

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Photo Courtesy of First Solar

FIRST SOLAR SET TO INSTALL 1 GW OF PV SYSTEMS IN 2013

FIRST SOLAR INC.

is living up to its name this year, with the No.1-ranked company expected in 2013 to become the first engineering, procurement and construction (EPC) firm ever to install 1 GW worth of solar or PV power systems in a single year.

The U.S.-based company is forecast to install 1.1 GW of solar systems in 2013, more than double its 516 MW in 2012, according to information and analytics provider IHS. This high rate of growth will allow First Solar to maintain its leadership in the EPC business for the year, despite even faster growth from Chinese rivals, No. 2 China Power Investment Corp. (CPIC) and third-ranked GD solar.

First Solar's growth is built on its strategy to cultivate a pipeline of PV projects, in which it takes on major undertakings, sells them to other firms and then uses the proceeds to buy other large-scale installations.

For example, First Solar in May announced the sale of the Campo Verde Solar Project, which is under construction in Southern California. Campo Verde will have a nameplate capacity of 139 MW of alternating current (MWac) when it is completed at the end of 2013. With the money it made from the sale, First Solar expanded its pipeline with the acquisition of three other projects under development with a total capacity of

260 MWac, due for completion by the end of 2015.

With the company's solar module business suffering because of falling prices, this is turning out to be a winning approach for First Solar.

"First Solar's successful strategy of acquiring, installing and divesting projects will keep the company among the world's leading solar system integrators over the next years," said Josefin Berg, senior analyst for downstream solar research at IHS. "This approach not only offers a sales outlet for modules, but more importantly, also generates project-sales revenue that cushion the company when seeking new growth markets."

SOLAR COSTS CONTINUE TO FALL AS INSTALLATIONS INCREASE

As solar energy installations spring up on rooftops and major power plants across the United States, the average cost of going solar continues to fall, according to a report released by the Department of Energy's Lawrence Berkeley National Laboratory.

"Because of smart policies, including the Investment Tax Credit (ITC) and net energy metering, solar is one of the fastest-growing industries in the United States, providing good paying jobs for nearly 120,000 Americans at more than 5,600 companies, many of them small businesses spread all across the country," said Rhone Resch, president and CEO of the Solar Energy Industries Association (SEIA). "Solar job growth has doubled in the past three years alone. Today, there is now more than 8,500 MW of cumulative solar electric capacity in the United States — enough to power more than 1.3 million American homes. And the more affordable solar becomes, the more American families and businesses can take advantage of this clean, inexhaustible energy source to meet their electricity and hot water needs."

The latest edition of Lawrence Berkeley National Lab's "Tracking the Sun," an annual report on solar PV prices in the United States, examined more than 208,000 PV systems installed between 1998 and 2012, as well as preliminary data from the first half of 2013.

KEY FINDINGS INCLUDE:

- The average installed price of residential and commercial PV systems completed in 2012 decreased by a range of roughly \$0.30/watt to \$0.90/watt, or 6 to 14 percent, from the prior year, depending on the size of the system. Installed prices for projects funded through the California Solar Initiative fell an additional 10 to 15 percent in the first half of 2013.
- Historically, installed PV prices have declined an average of 5 to 7 percent per year from nearly \$12/watt in 1998, with particularly sharp reductions occurring since 2009.
- The recent price decline in large part is attributable to falling module prices, which fell by \$2.6/watt from 2008 through 2012.
- Over the longer-term, installed system prices have also declined due to reductions in non-module costs, including inverters, mounting hardware, permitting and fees and other costs.
- Market-building policies that target non-module or "soft" costs represent a significant opportunity for continued price reduction.



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SUNEDISON SECURES FINANCING FOR 150 MW IN PROJECTS

A consortium of New Energy Capital Partners, North Sky Capital and EverStream Energy Capital Management announced it has closed an investment of \$67.3 million to fund the development and construction of utility-scale solar PV power projects in Central and Southern California by SunEdison.

"We depend on strong relationships with committed finance partners," said Tim Derrick, president and general manager of North America for SunEdison. "Working together enables us to deliver predictably priced clean

energy to our customers while generating construction jobs in the communities that will benefit from the energy generated by the projects."

The investment is expected to enable SunEdison to complete development and construction of more than 150 MW of solar assets. The projects are designed to generate an estimated 320,000 MWh of electricity annually and create hundreds of jobs for California electrical and construction workers.

"This investment offers attractive returns for our investors and

we anticipate that it will create approximately 250,000 man-hours of work for highly-skilled union laborers in California," said Scott Barrington, CEO of North Sky Capital.

"Developers face significant funding gaps at certain stages of the development cycle, and we are committed to bringing flexible and efficient capital to high-quality assets," said PJ Lee, managing partner of Everstream Energy Capital Partners.

The investment group was represented by Akin, Gump, Strauss, Hauer & Feld.

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BIG MOUNTAIN RANCH

Kyocera solar panels installed 10 years ago in the Rocky Mountains are still producing at 95 percent their original rating.

Photo courtesy of Sunsense Solar.



ROCKY MOUNTAINS

NO PROBLEM FOR 10- AND 20-YEAR-OLD KYOCERA SOLAR MODULES

KYOCERA SOLAR

Inc. solar modules installed on three individual sites in Colorado's Rocky Mountains have demonstrated long-term reliability and longevity despite extreme circumstances including a racking failure, high irradiance, freezing temperatures and heavy snow for months each winter.

A recent test by a North American Board of Certified Energy Practitioners (NABCEP) PV installation professional indicates that 10-year-old Kyocera modules are performing at more than 95 percent of their original rating in spite of the extreme environment at 8,500 ft above sea level, which involves the modules being buried under snow and enduring solar irradiance levels of roughly twice those of laboratory test conditions.

At Colorado's Big Mountain Ranch, an 8.2-kW off-grid hillside installation from 2003 was re-racked in 2011 due to a mounting failure in which the post-piers migrated downhill, creating severe torque and

stress on the module frames. Despite the structural damage, and after 10 years of operation, the Kyocera modules continue to perform well.

"We rebuilt the hillside and re-racked the system without needing to replace even a single module, and all 52 of the Kyocera modules survived this extreme racking stress in perfect condition," said Steven Haines, lead solar consultant for Sunsense Solar. "The results of the testing indicate that the modules are still producing above 95 percent of their originally rated short circuit current, even after a decade of service in an extreme environment. That's significant, especially after the trauma they went through on the previous rack where they were twisted and pinched as the old ground-mount rack settled down into the hillside. That could affect the modules' waterproofing and potentially cause internal water corrosion damage, but the Kyocera modules are working great."

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DEPENDABLE POWER

Kyocera panels installed on the Skinner hut by the 10th Mountain Division Hut Association back in 1995 are still as dependable and reliable as Day 1. *Photo courtesy of 10th Mountain Division Hut Association.*



installations using Kyocera solar modules in Colorado have been hard at work since 1991 and 1995, respectively, and both still power the loads they were designed for dependably and reliably. The 18- and 22-year-old systems electrify two backcountry huts in Colorado's mountains as part of a network operated by the non-profit 10th Mountain Division Hut Association for outdoors enthusiasts. These off-grid huts are only accessible by skis, snowmobile or, in summer, hiking, mountain biking or four-wheel drive vehicles. The Betty Bear hut's four Kyocera LA51 solar modules were installed in 1991; a system of the same size was installed on the Skinner hut in 1995. Both of the huts are located above 11,000 ft — where

extreme heat, cold and irradiance are the norm.

"Kyocera panels have certainly proven durable, and 10th Mountain Division hut visitors have enjoyed their dependable power for over two decades now," said Ben Dodge, executive director of the 10th Mountain Division Hut Association. "While the elevation of the huts puts them in an extreme environment and users are sometimes not as gentle or informed as they should be, the panels have withstood these challenges."

These installations validate other globally recognized tests and quality certifications that demonstrate the world-class reliability of Kyocera solar modules. Kyocera's modules were the world's first to be certified in

the Long-term Sequential Test performed by TUV Rheinland Japan. In addition, high-voltage stress testing by the Fraunhofer Center for Silicon Photovoltaics (Germany) revealed that Kyocera's solar modules did not show any decline in output after being subjected to severe conditions.

"With nearly 40 years in the solar industry, Kyocera has proven time and again that its modules are highly reliable even in the most extreme situations," said Steve Hill, president of Kyocera Solar Inc. "We're pleased that these three installations in the beautiful mountains of Colorado are living up to our goal of offering dependable solar power solutions while helping to preserve the environment for future generations."

REPORT: SOLAR PANELS GENERATE MORE WEALTH THAN STOCKS, BONDS

Connecticut, Massachusetts and New York now outrank California, Arizona and New Mexico in the amount of money each ray of sunlight can generate for homeowners, according to the Geostellar Solar Index, a new scientific and economic analysis of Americans' savings through rooftop solar.

The new quarterly index shows the Northeast and Mid-Atlantic states offer the highest Internal Rate of Return on residential solar energy, an economic analysis that measures and compares the profitability of investments, with profits as high as 24 percent per year over the 25-year life of the solar array. By comparison, the S&P 500 has shown a 9.9 percent Compounded Annual Growth Rate over the last 50 years, 30-year

U.S. Treasuries have a current yield of 3.7 percent and five-year certificates of deposit (CDs) typically return just 0.75 percent annually.

Surprisingly, California, Arizona and New Jersey, 2012's Top 3 solar states by installed capacity, are not among the Top 5 states in the index. Tax credits and other incentives in New York and Connecticut have helped propel those states toward the top of the Geostellar Solar Index, which is calculated using sophisticated economics, energy and environmental factors to rank all 50 states and the District of Columbia, and more than 3,000 counties nationwide, in order of profitability for residential solar installments.

The index criteria includes a detailed analysis of individual roof-

tops and their solar intensity, county-by-county tax credits, rebates, renewable energy credits and other incentives, local utility rates, installed costs of solar and other variables.

"In much of the country, the Geostellar Solar Index shows that homeowners can actually generate more wealth with solar panels than stocks, bonds, CDs or other investments," said David Levine, founder and CEO of Geostellar, the nation's first and largest online solar energy marketplace. "The index's findings show residential solar power is not only viable, it's a wise investment."

See the full annual yield rankings of all 50 states and the District of Columbia on solarbuildermag.com.

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ECOFASTEN SOLAR USES ITS ROOFING EXPERTISE TO
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By Kelly Pickerel

SHINGLES, tiles, slates, metal, rubber, thermoplastic, mud, grass, sticks — anything can be thrown on top of a roof for protection. And when someone wants to put a solar array on top of that mess of materials, knowledge of that roof trumps knowledge of how a solar array should be pieced together.

That's what EcoFasten Solar, a manufacturer of steep slope roof attachment hardware for the solar industry, believes. The Morrisville, Vt.-company has a strong background in roofing, and owner Brian Stearns says that's what constitutes a successful solar installation.

"I think the difference between EcoFasten and our competitors is that we are roofing people that make water-tight components for the roofing industry," Stearns says. "[Our competitors] are electrical contractors who make roofing attachments for the electrical industry that may not be roofing-friendly. Our competitors all seem to be electricians who needed to have a part that would allow them to attach an electrical component to the roof. But they don't understand roofing."



ROOFING WISDOM

In the '70s and '80s, Stearns honed his skills in the roofing industry, and after years of hard work, he realized the physical demands of roofing were not suitable for a lengthy career. So in 1992, Alpine SnowGuards was born. Stearns took his roofing experience and transferred it into a snow retention system manufacturing business, preventing avalanching snow off sloped rooftops.

LESS DISRUPTION

The GreenFasten mounting hardware secures with one fastener directly through the flashing. QuikFoot, EcoFasten's other popular mounting product, uses two fasteners hidden by the flashing.

Seeing a way to use its design and manufacturing expertise in the maturing renewable energy industry, Alpine SnowGuards introduced a new division — EcoFasten Solar — in 1996.

QUICK CONNECTION

The QuikFoot product has a baseplate that is fastened to the roof with a flashing over top. All EcoFasten mounting hardware is watertight and secure.

Stearns saw a disconnect between the roofing industry and solar integrators. Not all roofs are the same, so solar racking and mounting products shouldn't be treated as one-size-fits-all. EcoFasten has products for commercial/flat rooftops, but its real bread and butter is with steep slope roofing — essentially residential installations. For metal roofs, there's the Simple Seal product, and for shingle, slate and tile roofs QuikFoot came first, followed by GreenFasten.

"QuikFoot was initially well received, but the integrators at the time felt that it was too expensive," Stearns says. "So we went back to the drawing boards and came up with a part that we call GreenFasten that is more of a flush-mount kind of assembly that is not as costly."

QuikFoot uses two fasteners while GreenFasten and most competitors use one. One-fastener systems might cost less because there are fewer components, but sometimes a cheaper system isn't the best choice.

"In areas with high wind uplift or in areas where there is a rack component that is strong enough to span a greater distance, the QuikFoot part will probably save money," Stearns says. "It's still a more expensive part than a GreenFasten, but it's probably more cost effective in those higher demand zones."

The QuikFoot product has a baseplate that is fastened to the roof, with a flashing that goes over top the baseplate. GreenFasten has no baseplate; the fastener is secured through the flashing.



"The baseplate component is missing from most of the products in the industry," Stearns says.

EcoFasten focuses just on roof attachment hardware. No rails, racks or other BOS components are in the company's product lineup.

"EcoFasten Solar focuses on water-tight, structural roof attachment hardware, period," Stearns says. "We don't get involved with the racks or panels or inverters, just the attachment hardware. Ninety-nine percent of the time, rails are attached to our components; however, there are a couple people looking at our products for attaching panels directly to a component that they may make."

FUTURE PROGRESS

Stearns says there is room for evolution in residential solar construction. Building-integrated photovoltaics (BIPV) might one day be a threat to business, but right now things are going well for EcoFasten.

"[Solar shingles] have been talked about and kicked around now for 10 years probably, and I don't know anybody who is actually installing them. It hasn't

affected our market at all," he says. "In fairness, it could be because the market is growing quickly enough that our market has not been affected even though there is some of that coming into play. We're just not affected."

EcoFasten will continue to focus just on roof attachment hardware and improve its products.

"I think that the industry is looking for a solution that will save money, and what appears to be on everyone's target is racks," he says. "How can you reduce the cost of racks and reduce the number of attachment points to reduce the overall costs? The QuikFoot component answers the question of a stronger component that will allow less parts to be used. I think that there are companies out there working on eliminating racks, but I just don't see any yet that are cost-effective."

Overall, EcoFasten isn't too worried about eliminating racks or solar shingles. The company knows roofs, and there will always be shingled, tiled, rubbered and mud-covered roofs to worry about. ■

Kelly Pickerel is associate editor of *Solar Builder*.

BOS

SUPERCARGED

⊕ A Q&A WITH TROJAN BATTERY COMPANY ⊖



SOLAR BUILDER SPENT some time talking with Dean Middleton, director of renewable energy sales for Trojan Battery Co., about the basics of using batteries with solar installations and what's in the future for energy storage. Here's a crash course in batteries and energy storage in the solar industry.

What type of batteries does Trojan manufacture for the solar industry?

Trojan Battery Co. focuses exclusively on deep-cycle battery technology. It's not a sideline for us; we're not building automotive batteries and then having a minor focus on deep-cycle. The company was started in 1925, and we're in

the fourth generation of the original family.

There are two general classifications for deep-cycle batteries — flooded and VRLA (valve-regulated lead acid). A flooded battery is an open-cell battery that has removable vent caps and requires maintenance on a regular basis, consisting of topping off the electrolytes with

distilled water. VRLA is often referred to as maintenance-free — you cannot remove the vent cap and refill the electrolytes. That means you essentially have a partially sealed battery, and it's designed so that you don't have to maintain it.

VRLA falls into subcategories: gel and AGM. Each one has pluses and minuses depending on the details of the application. We as a company are focusing on expanding our AGM line. We feel that AGM is the technology that has the broadest applications in the solar market in the future.

Why would people choose a flooded battery over a maintenance-free VRLA?

The benefit of a flooded battery is that you're going to get longer-term performance, better cycle life and, more importantly, it's going to be at a lower cost. You're going to get more for your money with a flooded battery over any VRLA technology in any size.

With a VRLA, why would anyone pay more for less performance? You have to take into account the application. For example, if you have a lighting project that has 1,000 light poles along a highway that are solar powered, and you have one battery at each light pole in an enclosure, 30 ft off the ground, the last thing you want is to have a service truck go around to each battery on a monthly basis, climb the pole, open the battery and add distilled water. It doesn't make economic sense. In an application like that where you have low power and multiple systems deployed in an isolated project, maintenance is a real issue. It makes sense to go with a maintenance-free battery even with the loss of cycle life. You really have to take into account the economic drivers of a project.

What is "cycle life"?

A deep-cycle battery is designed to be deeply discharged and then recharged over and over again, unlike a car battery. When you take a car battery down to zero, you kill it. The deeper you discharge a deep cycle battery, the less cycles you get out of it. If you take the battery down to 100 percent depth of discharge (DOD), meaning you've taken all the energy out of it, you're going to get X amount of cycles. But if you take it down to 50 percent DOD, using half of it on a regular basis, you're going to get more than X. Every deep-cycle battery is going to have that curve, showing you the relationship between the DOD and cycle life. The more conservative you are in your design, the longer your system will last. Most manufacturers, Trojan included, don't recommend that you design your system for any more than 50 percent DOD, to get the most life out of a battery.

Are there any standards/testing for batteries?

In the battery industry, we don't have an equivalent test (compared to module testing). If I show you a cycle life graph for my battery, it's not necessarily based on the same conditions as my competitor. It's a very unfortunate situation for the end-user. Customers are out there comparing cycle lives, assuming all things are equal, and nothing could be further from the truth.

One of the things that we spent a lot of time on in the last year is bringing to people's attention that there are some internationally recognized standards available (IEC 61427, more specifically), and we test our products to those standards, and we feel that other manufacturers should do the same. We're doing a lot of education in that regard. IEC 61427 is specific to deep-cycle batteries and it comes

closest to representing a battery-based solar system. It's a very challenging test that puts the battery through a workout that is closest to what it's going to experience in the field. We also do third-party testing to prove that a battery rated to this standard with a healthy cycle life is better than one that doesn't.

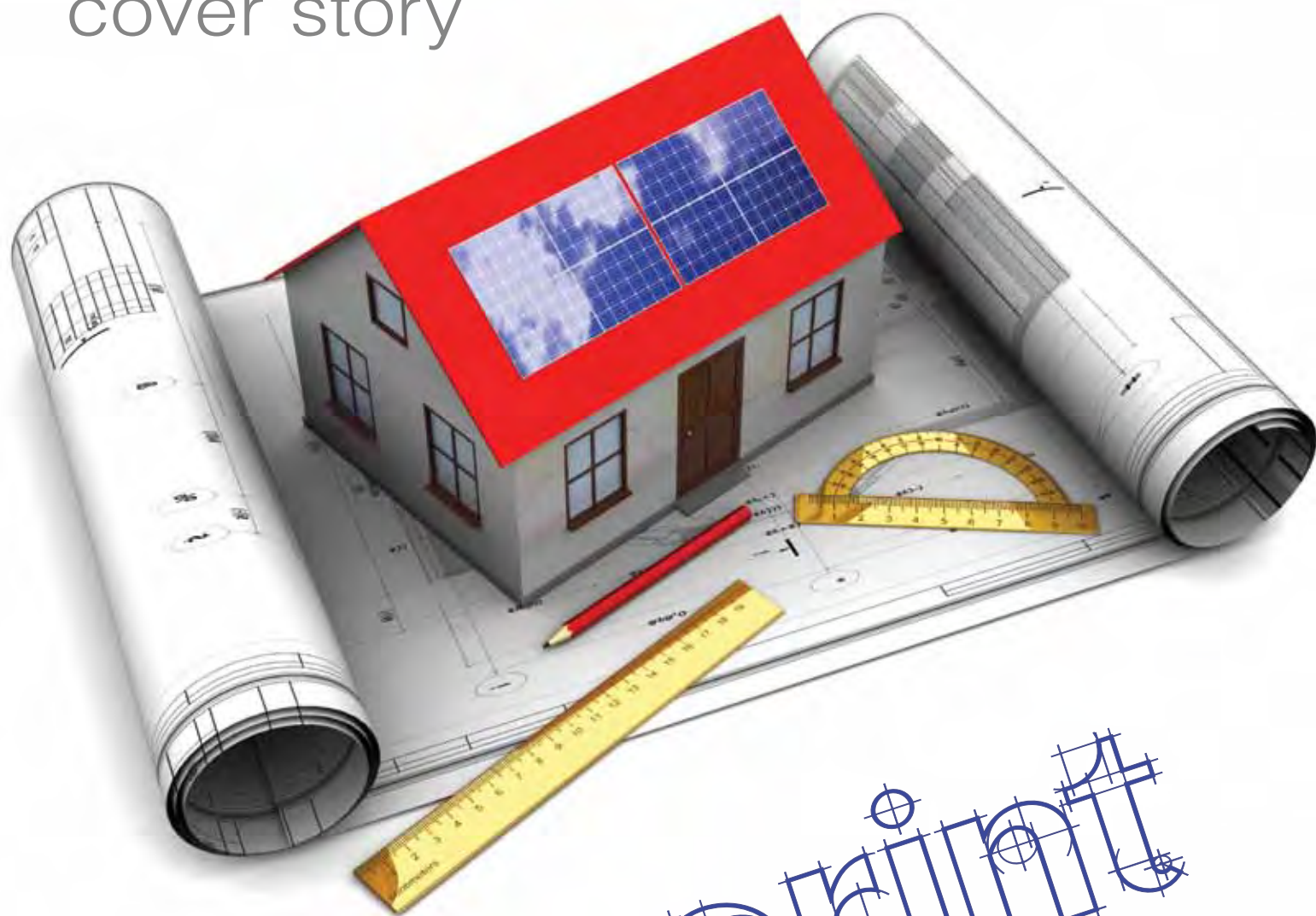
What do you expect in the near future for energy storage?

We'll start to see more incentives for energy storage to be included as a part of grid tied solar systems which have historically not included on-site storage — that is the trend in Europe. There will be more incentives to add battery banks to both existing and new grid tied solar system installations. I think we're going to see a lot of new products in the next few years in terms of better integrated packages, more consumer-oriented packages. I don't see too many companies out there with well designed, consumer-friendly packages. That is a huge opportunity for U.S. distributors and integrators that are already working in that space.

There is a lot of excitement about energy storage, but I think there are a lot of people that aren't sure which way to go. There are a lot of people out there looking for solutions. Who can provide me with the whole package? I see a window of opportunity to integrate the inverter component, the battery component, the disconnect component, the circuitry into a single system that can be sold on the residential scale. I think that's where we'll see quite a bit of change in the next year or two. ■

Dean Middleton has spent more than 18 years in global sales and export of PV and solar thermal systems and joined Trojan Battery in 2009. Visit trojanbattery.com for more info.

cover story



New Blueprint for Rooftop Solar Analysis

A web-based program
funded by the U.S.
Department of Energy redraws
the approach for finding a
property's solar potential.

By **David Herrmann**

Web-based technologies are having a transformative impact on many industries by enabling companies to conduct key business functions in a way that is faster, less expensive and more responsive to customer needs. Just think about how easy it is today to stream a movie on a rainy day compared to the process of driving to a rental store just a few years ago and hoping there is something good on the shelf. Digital technologies have re-invented processes that were previously slower, more labor-intensive and expensive in the analog era, and that same kind of transformation is poised to happen in the solar industry in a way that benefits both solar installers and customers.

Before we get into that technology, though, we should all admit something about energy and solar technology: It's confusing to customers. For average homeowners or property owners, their understanding of energy consumption likely doesn't go

much beyond a rough estimate of what their last utility bill cost. Many have no idea how much they consume in terms of kilowatt hours, let alone understanding whether their property is a good candidate for rooftop solar panels. The U.S. Department of Energy (DOE) recognizes that need for public education, and it sees digital technology as a key to make it simpler for property owners to understand how they can benefit from solar installations. The DOE strongly believes that a better-educated, energy-savvy public will grow the solar market in a way that drives revenue for installers.

In addition to growing the market and driving revenue for solar companies, the DOE also sees digital technology as critical for helping solar companies respond faster to sales opportunities while also lowering the cost of pursuing each potential customer. "Hard costs" — the cost of PV panels and related hardware — have decreased over the past several years thanks to

lower cost of manufacturing. However, while the costs of the panels have fallen drastically over the past several years, the National Renewable Energy Laboratory (NREL) recently reported that soft costs made up almost 40 percent of the cost structure for solar providers in 2012, including the cost of customer acquisition, the cost of permitting, overhead, taxes, etc.

One of the largest components that make up the soft costs is the cost of customer acquisition. Estimates of the cost of customer acquisition today range from \$2,000 to \$3,000 per customer, which can equate to more than \$0.50 per watt for small installers and \$0.20 to \$0.30 per watt on average. Much of the cost of customer acquisition is in two areas: 1) money spent to engage consumers and get them to take action, and 2) money spent on

IMMEDIATE ANALYSIS

The Sun Number web-based computer program can instantly determine if a rooftop is ideal for solar. This saves the installer and customer time, paperwork and headaches.

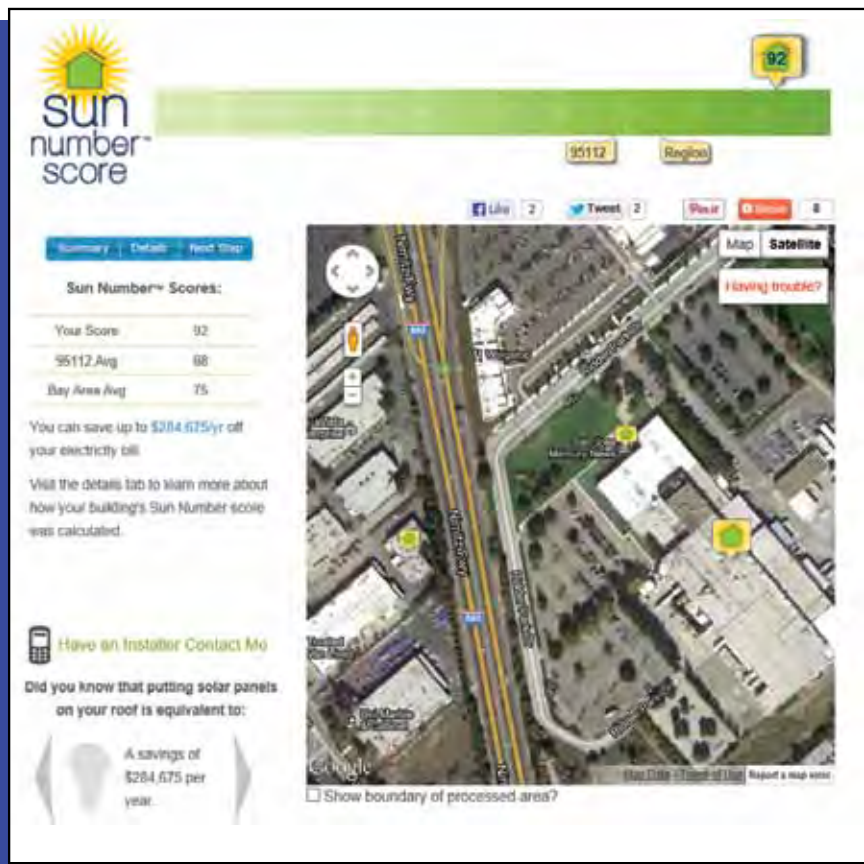


cover story

evaluating and providing quotes on properties that have not been properly vetted for solar potential. The DOE's most recent round of SunShot grants has placed a special focus on reducing these soft costs, and that is where web-based technologies come into the story.

In 2012, Sun Number received a grant to complete development of a web-based solution that would address both of those aspects of customer acquisition. In addition, the SunShot grant asked Sun Number to develop its solution in a way that would also educate the public about the benefits of energy that would drive sales leads to solar installers.

Sun Number's solution is a web-based application that enables solar companies to get instant analyses of the rooftop solar potential of a property while the company is on the phone with the potential customer. This is a dramatic change from the traditional method of doing rooftop analyses, which requires an employee to wait for good weather, roll a truck to the property, climb up on the roof



and conduct a physical examination that typically requires half a day. Then when the employee returns to the office, there is still quite a bit of work to be done in preparing a report that the sales team can use for a followup conversation with that customer.

That “pre-digital” process often takes seven to 10 days in total, which brings the sales process to a halt. It also adds a significant amount of soft costs to the process, totaling hundreds or even thousands of dollars. The DOE was excited about Sun

SUNSHOT INITIATIVE



The SunShot Initiative was announced in February 2011 by the U.S. Department of Energy Solar Energy Technologies Office with the goal of making solar energy cost-competitive with other forms of electricity by 2020. The initiative drives research, manufacturing and market solutions to

make the abundant solar energy resources in the United States more affordable and accessible for Americans. To accomplish its goals, the DOE supports funding opportunities through an open, competitive solicitation process.

Some current SunShot Incubator recipients include:

Sun Number (\$402,050)

See above article.

Princeton Power Systems (\$1,000,000)

Princeton Power Systems is developing an inverter that regulates DC power from PV strings to 13.8 kV AC without a grid side transformer. Its 2-MW, six-port inverter was announced in November 2012.

Clean Power Finance (\$500,000)

Clean Power Finance is building an online marketplace that will increase certainty for O&M by providing back-up servicing for solar PV systems.

EASY INPUT

Using high-resolution data and GIS software, the Sun Number program evaluates rooftop details and scores each building. In this example, the building receives a 92, meaning it is pretty close to perfect for solar generation.

Number's web-based approach because it eliminates those 10 days by providing instant analyses, and a web-based solution also reduces the cost of solar assessments by up to 90 percent through a low-cost web service that is much less expensive than the labor-intensive traditional method.

Sun Number uses high-resolution aerial data and GIS software that evaluates the rooftop details of every building in a city. The rooftop pitch and orientation is computed allowing Sun Number calculations to only include roof planes that are ideally suitable for solar PV. It also de-rates the solar production of portions of the roof that are oriented west and east compared to portions that are oriented south. Sun Number uses LiDAR as the aerial data and has algorithms that factor in local weather conditions, the impact of shade from surround-

ing vegetation and buildings and other factors that would impact solar suitability. An analysis is provided on-demand to solar installers by simply typing in the building address into the website.

The report provides all of the information that an on-site visit would produce, plus additional information that is only possible through a Sun Number analysis. For example, a score for each building is created ranging from 1 to 100 as a measure of the rooftop's solar suitability. A score of 100 is a perfect roof for solar, a score below 50 is an indication that the rooftop is not suitable. Along with the overall score, the tool gives solar providers an estimate of the dollar figure for electricity that rooftop solar on the building would generate, which is a key factoid that customers are interested in hearing. Sun Number also provides information about the likelihood that the owner of the building will qualify for a solar lease or a loan for a solar purchase.

This web-based solution allows solar installers to shorten the sales cycle with customers by instantly providing them with an analysis of how suitable their

rooftop is, which enables the dialogue to move on to the price quote phase. This web-based approach also saves hundreds or thousands of dollars in soft-costs for each sales process, enabling solar installers to dramatically reduce their cost structure and increase their margins on each successful sale.

Sun Number has made a version of the tool available free to the public in order to support the DOE's goal of increasing public education about solar energy. Homeowners and other property owners can look up their own address, get a Sun Number Score for their home, compare their score against the local average, get an estimate of how much they could save off their utility bill and then click to connect with a local solar installer to start a dialogue. To see a demo of the tool, visit sunnumber.com. ■

Dave Herrmann has extensive experience in the solar industry and is a co-founder of Sun Number. He is now leading the company's business development efforts. Visit sunnumber.com for more info.

Solar Mosaic (\$2,000,000)

Solar Mosaic brings much-needed capital to the solar industry by building a web platform for everyday Americans to create and fund solar projects. Mosaic's unique online crowdfunding platform will enable thousands of Americans to own a piece of the growing clean energy economy.

Tigo Energy (\$500,000)

Tigo Energy is developing innovative software for solar PV systems that will use module-level monitoring data to automate key steps in the commissioning process, analyze system performance characteristics and optimize the scheduling of ongoing O&M activities.

QBotix Inc. (\$972,874)

QBotix is pioneering the use of robotics in the operation of solar power plants to reduce LCOE by 20%. The system enables 50% cost reduction in dual-axis tracking, high system reliability and detailed power plant level data and is compatible with all PV panels.

Simply Civic (\$499,510)

Simply Civic is streamlining management of permitting, inspection and interconnection through an online application. The tool will seamlessly enable jurisdictions and installers to track the status of solar projects in real-time and make it faster and simpler to process required paperwork.

feature



INTELLIGENCE TO THE RESCUE!

***RULES AND REGULATIONS MAY TRY TO HOLD THEM BACK, BUT
SMART INVERTERS WILL SOON BE AN INTEGRAL
PIECE OF THE SOLAR PUZZLE.***

BY KELLY PICKEREL

Inverters are an important — albeit boring — part of a solar power system. They convert the DC power produced by the solar array into AC power ready to use by the masses. Over and over and over again.

And that's all. No bells, no whistles. The traditional electric grid really won't let them do much more than that basic conversion. But smarter inverters can do more with a smarter grid.

The "smart grid" is a modern version of the traditional electrical grid, using information and communications technology to improve on efficiency and reliability. Using constant communication and monitoring, a smart grid would improve fault detection and allow for self-healing because problems could be found before they attack. But until the smart grid is finished (efficiencies are still evolving), smart inverters can pick up the slack.

An inverter with smart capabilities transforms the unit from a simple power converter to a piece

of equipment necessary for grid durability.

"Inverters were designed to feed as much active power available from the solar array to the grid," says Thomas Enzendorfer, director of sales and marketing for Fronius USA, an inverter manufacturer. "Recently, utilities have shown enormous interest in inverter capability to absorb and provide reactive power from and to the grid."

Most PV inverters run below their rated power output because they're sized to convert the maximum available energy from the solar array. But the weather, panel orientation and seasons affect the actual power being converted. A smart inverter can take that reactive power — or temporarily-stored power — and feed it on demand to help the grid recover from distant faults or momentary sags in power.

"In the past, the inverter had no interaction with the grid other than pushing energy into the grid," says Martin Beran, head of system support for Fronius USA. "With a smart inverter, it has communication. It can be controlled from out-

side the PV installation by the utility or whomever. [It has] additional functionality and features, having the capability to stay on the grid when the grid is in a difficult situation.

"For a long time PV systems and inverters were seen as a threat to the grid," Beran continues. "PV installations are making the grid unstable,' some have said in the past. [But] when you use the whole capability of power electronics, then the inverters could help stabilize the grid way differently than [before]."

INTELLIGENT DESIGN

Fronius introduced a new line of smart inverters earlier this year. The Fronius IG Plus Advanced Inverters are well suited for small residential and light commercial installations. The inverter size ranges from 3 to 12 kW.

These advanced inverters are "smart" because of their extra capabilities and features. The new Fronius inverters have grounding selectable on site, are designed for indoor or outdoor installations and



ACTIVATION OF SMART INVERTERS] VERY OFTEN WOULD IMPROVE GRID STABILITY AS WELL AS QUALITY IMMEDIATELY.

THOMAS ENZENDORFER, FRONIUS USA

have integrated DC disconnect, a power plug system and field programmable AC output voltage. The Fronius IG Plus Advanced Inverter lineup is the first high-frequency PV inverter to have NEC 2011 compliant arc-fault circuit interrupter (AFCI) protection in the United States. Fronius created the IG Plus Advanced Inverter with arc-fault protection and advanced features specifically for smart grid integration.

But the U.S. grid can only benefit from some of these advanced features today.

"From a technical point of view, inverters with advanced grid features can be used in most of the typical installations we know today," Enzendorfer says. "Activation very often would improve grid stability as well as quality immediately. However, interconnection requirements and grid codes (for example, IEEE 1547), as they are written today, are contrary to the capabilities of smart inverters. Therefore, permission from the grid operator is required to turn on an inverter with advanced grid features. We see the change of codes and standards in favor to smart grid fea-

tures of distributed generators changing in the not-so-distant future and also become requirements for high PV penetration areas."

While waiting for rules and regulations to allow the grid to catch up to the technologies out there, the Fronius IG Plus Advanced Inverters can still be used successfully in a traditional sense. The advanced inverters use Fronius Master Inverter X-Change (MIX) Technology, which allows them to achieve maximum yield, even when in the partial-load range. Fronius documents describe the system as all power modules working equally, with the "master" module allocated alternately, taking into account the operating hours worked. Loads are applied evenly to individual power modules and the operating time decreases. The new inverters also use a high-frequency (HF) transformer which provides a constant level of efficiency, resulting in higher yields as well as lightweight design.

This high-tech inverter is installed the same way as a traditional inverter.

"There are no additional

requirements in order to install the inverter," Enzendorfer says.

"Because of the modern design of the inverter lineup, they make it very easy for the installer to install them as a regular inverter."

While modern, the IG Plus Advanced Inverters were designed to be ready for smart grid evolution.

"The way we built them is to make sure they are capable of changing environments that may or may not happen over the next few years," says Enzendorfer.

Fronius is looking ahead, designing inverters for tomorrow, not today. The new IG Plus Advanced Inverter class is ready for the smart grid before it exists, with smart functions built into the devices. The advanced inverter still functions as a successful traditional inverter when hooked up to the grid today. And once that smart grid comes into play, it's ready to go. No extra parts will have to be installed after the fact.

Ready when you are, smart grid. ##

Kelly Pickerel is associate editor of *Solar Builder*.



One size doesn't fit all, but one company does.

Built for the real world

feature



THE INDY 24,000 (kW)

The Indiana state capital
motors its way into
the solar record books.

By Kelly Pickerel



THE INTENSE SOUND

of power echoes off the coliseum of the Indianapolis Motor Speedway every Memorial Day weekend as 33 drivers vie to be the winner of the historic Indy 500. Nearby Indianapolis International Airport (IND) has harnessed a different kind of power to win another history-making race: the first U.S. airport with a solar farm in the double-megawatt-digits.

The 75-acre, \$40 million solar farm sits at the entrance to IND. The 12-MW project broke ground in mid-March 2013, and less than one month later, a second identical farm was approved on the other side of the entrance.

The first phase was already determined to be the largest solar farm at an airport. Multiply that by two and IND is making a big statement. The first phase and its 41,000 panels were introduced to the world at a commissioning ceremony in September; the second phase is expected to be finished in Spring 2014.

"It's going to be a very much iconic symbol for Indiana and Indianapolis that further ensures we are a green city and a green state," says Eric Anderson, director of properties for IND. "[The solar farms] are the first and last thing people will see coming in and out of our city."

IND started exploring solar options about two years before the project was announced. The success of Denver International Airport's three solar farms, including the July 2011 commissioning of a 4.4-MW ground-mount system, really

pushed IND's plans. A request-for-proposal was sent out, and after sorting through a good number of respondents, IND went with a local entity that provided the best deal.

ET Energy Solutions — a joint venture between Indianapolis based Johnson-Melloh Solutions and the Telamon Corp. — broke ground on the first 12-MW solar farm with general contractor Cenergy Power. During construction, around 140 temporary positions were filled while 12 permanent positions have been created to manage and maintain the solar farm.

The Indianapolis International Airport is the land owner of the solar farms, leasing the two 75-acre plots to ET Energy Solutions for 30 years. ET Energy Solutions is then selling the power produced to Indianapolis Power and Light (IPL) through a feed-in-tariff program.

Airports may have a lot of land ideal for solar installations, but many approvals need to be met. IND had to get a land release from the government, air spacing approvals from the Federal Aviation Administration (FAA) and glare study approvals for the pilots.

"We had to get FAA approval," Anderson says. "This land was pretty limited on what we could do with it anyway because it is closer to the approach of Runway 5. You had a pretty good height limitation on what you could do there, and this [solar] application fits really well."

Alexa Amatulli, marketing and project coordinator for Telamon

Corp., says construction of the first phase went ahead of schedule.

"Sometimes construction is over-estimated, which held true in this case," she says. "The timeline was extended due to any weather concerns, and since the weather has cooperated, there were only minor delays."

Cenergy Power construction manager Chris Sears says working on the IND solar farm — ahead of schedule and under budget — has been "a breeze and one of the best projects I've ever done."

Sears also says building a solar farm at an airport with planes flying above has been unique, but he's never felt unsafe.

"We've had no issue with the airlines, airplanes coming in," he says. "One portion is toward one of the runways, but by the time they're coming in, they're still well above us. It's kind of interesting."

The solar farms at the Indianapolis International Airport offer a birds-eye view of solar power to travelers visiting the city.

"Airport-based solar farms show creativity on the airport's part for thinking of non-airline generated revenue," Amatulli says. "The solar farm also contributes to the Indianapolis International Airport's green initiatives. The solar farm does send a message to airport travelers on the importance of energy efficiency in everyday life." ■

Kelly Pickerel is associate editor of *Solar Builder*. Airport construction photos courtesy John Bragg Photography.

SOLAR HOME IMPROVEMENT

A Sungevity salesman educates a Lowe's customer about solar inside a store. Sungevity has been working with Lowe's stores across multiple states since 2011.

Photos courtesy of Sungevity.



THINKING

INSIDE THE BOX

Partnering with big box stores allows solar installers to increase job prospects.

By Charles W. Thurston

NATIONAL BIG BOX

retailers like Costco, Lowe's and Home Depot can drive up deal volume for solar installers lucky enough to be able to co-market at store sites, but only a handful of players seem to be locking up most of the business in many of the biggest solar states. Opportunities still exist, however, in moving into untapped regions, in forging strategic partnerships with regional or local hardware or home improvement chains and in forming relationships with other energy service vendors.

Perhaps the oldest relationship between a big-box retail store and a solar company is that of REC Solar and Costco, now about a decade long. "We are probably in about 150 Costco stores now," says Ethan Miller, general manager of REC Solar's regional business.

"The value of the retail partner is that the consumer wants a more mainstream solar buying experience, so add the demographics and the credibility of both sides and it provides a great avenue to acquire leads and customers," Miller continues. "The consumer feels like you had to go through some vetting process to even stand in the store; that's got to help your close ratios."

For Costco, "We need a solar installer we can trust to expose our 70 million customers to [and] who also guarantees to save customers money," says one Costco employee who asked not to be further identified. "We also want a company that will be around in five years if warranty issues come up. In return, we take back a very, very small referral fee."

Another relatively early mover in this marketing channel was Oakland-based Sungevity, which aligned itself with Lowe's in May 2011 for an eight-state program to offer residential solar packages. At the time, Lowe's national network

included 1,750 locations and a customer flow of 15 million per week; the agreement then covered states where Sungevity had operations, including Arizona, California, Colorado, Delaware, Maryland, Massachusetts, New Jersey and New York. Today, Sungevity is also in Connecticut, Australia and the Netherlands. As one element of the deal, Lowe's took an undisclosed equity share in Sungevity. To finance its sales, Sungevity has taken on venture capital partners. Lowe's declined to comment on the relationship.

"Our Sungevity RSAs (retail solar advisors) assist the stores in selling solar, train Lowe's associates

on the Sungevity process, help qualify customers and create events to drive awareness of the program," says Liz Ludwig, Sungevity's vice president of marketing. "A strong percentage of our Lowe's customers come directly from Lowe's associates."

In a similar relationship, the nationwide installer/leaser SolarCity partnered with Home Depot, beginning in the Western region. SolarCity, now a publicly-traded company, finances its own sales through corporate fundraising.

Home Depot also partners with a New England regional installer, Roof Diagnostics of Wall Township, N.J., which has expand-

SELLING PARTNERS

Sungevity says that a strong percentage of its Lowe's customers come directly from Lowe's associates spreading the word about the advantages of solar.



ed rapidly after initiating sales at the chain, according to Kelcy Pegler Jr., company co-founder. His company began its Home Depot relationship in a pilot program in 14 New Jersey stores, thanks to lease financing partner SunRun. Now Roof Diagnostics plans to be in 175 stores by the end of the year — in Connecticut, Massachusetts, New Jersey, New York and Pennsylvania.

“A good store generates \$1 million in solar sales,” Pegler says. “We haven’t necessarily reduced our marketing costs per sale since we started in Home Depot, but the sheer volume means that almost the same processing team — for customer closing, permitting, design, utility coordination, etc. — that was handling 30 projects a month now can do 130.” Home Depot declined to comment on the relationships.

All these installers operate manned kiosks inside or outside the store and also encourage store employees to recommend their services. All acknowledge that the store reputation enhances their product acceptance by the customer. Once the sale is made, some installers use their own employees to do the installations while others subcontract the job.

“Sungevity supports local businesses by partnering with the very best local installers in our customers’ communities,” says Ludwig. Rapid expansion has led them to raid other solar companies for employees at times.

Yet other installers, like SolarCraft of Novato, Calif., have strategically opted to pursue opportunities closer to home, tying up with smaller regional hardware chains, like Friedman’s Home Improvement in California.



GROCERIES, APPAREL AND SOLAR

It might seem odd to have a solar display by the clothing section, but REC Solar says being in Costco stores — no matter what section — has provided more opportunities to consumers wanting a mainstream solar buying experience.

SolarCraft, which also works with SunRun for lease financing, also employed manned and unmanned kiosks in the three-store chain. And some installers are partnering with individual hardware stores, like SolarWorks of Cottonwood, Ariz., which set up marketing at a local Ace Hardware.

At least one hardware store began its own solar division, selling systems in the store and sub-contracting the installations out to local contractors. Hassett Hardware’s Palo Alto branch in California started out installing a few panels on its own building in 2000. Within two years, it had sold \$3 million worth of residential solar systems. While the extra sales were promising, the company has since given up its side business in solar, in part because a member of the family-owned business retired.

But Hassett Hardware’s success proves that solar can find success even at the smallest hardware store.

“Smaller installers should play to their local area and not try to reach out to the likes of Home Depot because that is a different scale of operation,” says Carter Lavin, business development director at Solar Marketing Group in San Francisco. “Your value proposition is the same as your local hardware store.”

Whether it’s on a large scale or small, going where the jobs are makes sense to any business owner. In the case of solar installers, working with big box stores opens the door to new potential customers. ■

Charles W. Thurston is a freelance writer who covers solar energy from Northern California. Reach him at chazwt@gmail.com.



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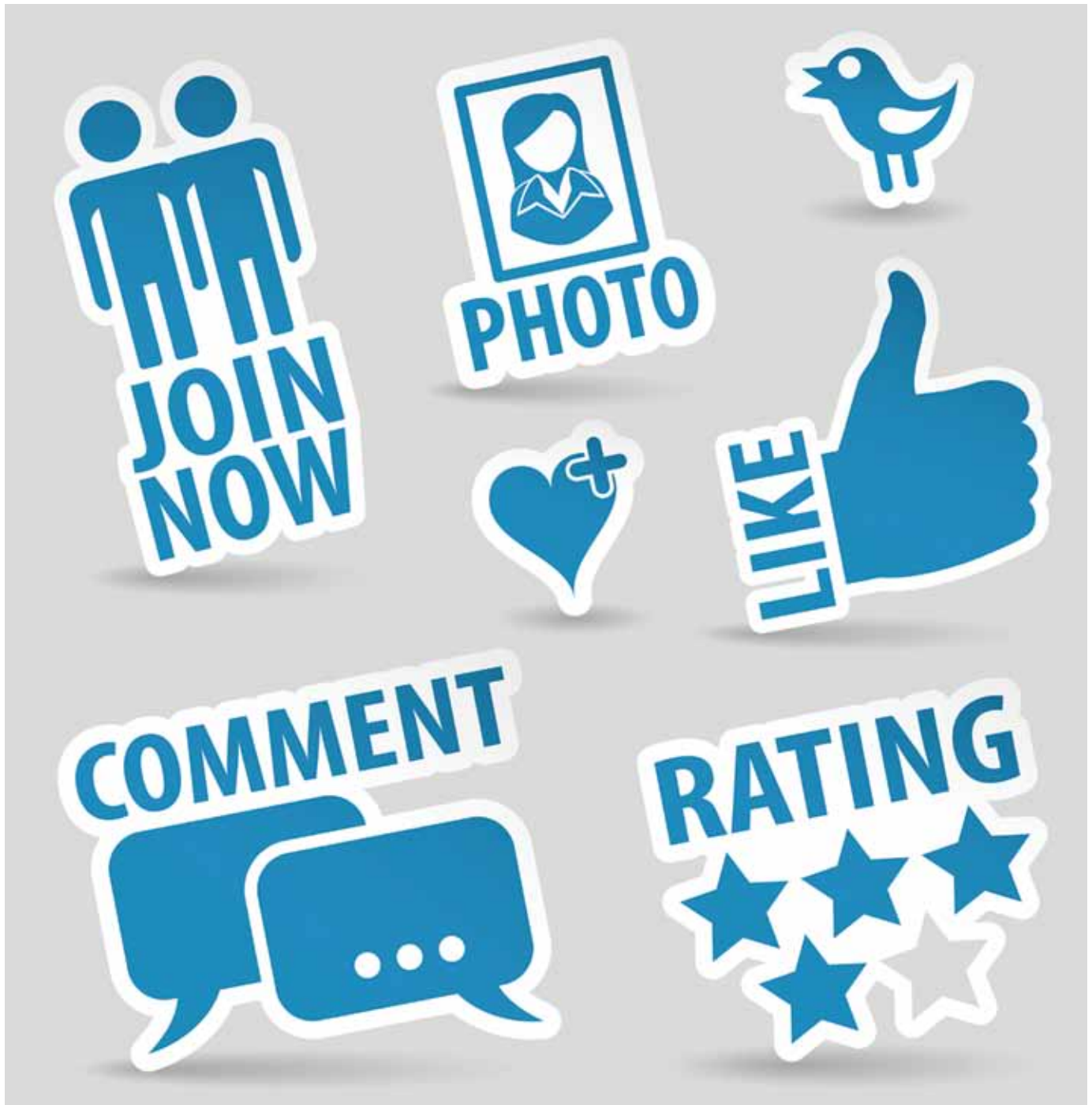
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feature

THE RISE

OF CONTENT MARKETING



By using social media and blogging, solar companies can present themselves as experts in a competitive, wide-spread industry. *By Alyssa Pacaut*

WITHIN THE PAST

couple of years, content marketing has become an increasingly popular tool for marketers across all industries. Recently, eMarketer, a digital marketing company, ran a survey asking companies about their strategies and tactics. In 2012, 18.9 percent of marketers said that content marketing was their primary marketing tactic. This figure nearly doubled in 2013 to 34.8 percent and is expected to increase again next year.

Content marketing is the process of creating and curating content to educate your customers, which will ultimately convince them to purchase your products and services. "Content" is a fairly broad term that can mean anything from articles and videos to photos, white papers and infographics. For many small businesses, a content marketing strategy results in posting informational blog posts on a regular basis that are valuable to their customers.

A SUCCESS STORY

A good example of using content marketing comes from Marcus Sheridan, co-founder of River Pools and Spas in Virginia. After watching the sales of his company dwindle to almost nothing, he embraced content marketing in 2009 and started writing informational blog posts that educate people about fiberglass pools.

The articles he writes are simple and straightforward. Most of them merely answer questions that customers typically ask, but other regular topics include pool maintenance how-to's, reviews of new products and technology and general news about the pool industry.

By the time a potential customer picks up the phone, they are well-informed and already trust the company as a pool expert — making it that much easier for Sheridan's sales team to close leads. Now four years later, River Pools and Spas sales have increased dramatically and the company's website is the most trafficked of its kind.

GETTING STARTED

When brainstorming ideas, gather your staff and have each person write down 10 to 15 questions that always come up. Within minutes, you should have enough topics for a year's worth of blogging. Be sure to include a range from the most basic questions to more complicated or technical questions. This way you can appeal to a variety of consumers.

You may consider asking more than one team member to get involved with the company blog. While it exposes your blog readers to different voices and personality types in your office, it will also help spread the workload of creating content and allow you to post more frequently.

Finally, don't worry too much about perfect grammar or writing journalist-worthy articles. If you talk to your customers in a casual tone, then write in the same way. If you are known for a great sense of humor or tend to be more formal, let that come through in your writing. A blog is the perfect vehicle to reinforce your brand and share your company's personality with potential customers.

BUILD TRUST, BUILD A CUSTOMER BASE

As consumers become savvier and more people complete extensive online research before contacting a company, content marketing will become increasingly important. By regularly updating a company blog, you allow people to find you through organic online searches and, most importantly, gain their trust by reading through educational articles about your solar company, services and products. Getting started today with your content marketing strategy will generate more sales prospects tomorrow. ■■

Alyssa Pacaut is marketing director at AMECO Solar, a solar installer based in Southern California. You can find her online posting content on AMECO's blog at solarexpert.com/blog and the company's social media accounts.

THE FULL SPECTRUM OF SOLAR OPPORTUNITY

SPI BLOWS INTO THE WINDY CITY THIS OCTOBER

THE SOLAR ENERGY industry is in high gear and at Solar Power International 2013 (SPI), October 21-24 at the McCormick Place in Chicago, participants can plug into the technologies, personal connections and professional insights that give rise to new business and learning opportunities.

Widely regarded as the can't-miss industry event of the year presented by the Solar Energy Industries Association (SEIA) and Solar Electric Power Association (SEPA), SPI draws more than 15,000 professionals in solar energy and related fields from 75-plus countries. Nearly 700 companies representing the entire solar industry spectrum

exhibit on 300,000 net sq ft of space.

SPI presents a full range of opportunities to make connections in Chicago and throughout the solar energy industry. Build your network face to face in SPI's general sessions, conference sessions, receptions and training workshops or as you explore the dynamic exhibit floor.

What follows is a snippet of the products and services exhibitors at SPI will highlight. Stop by their booths and see how they plan to improve the industry for 2014. And also be sure to stop by and chat with the *Solar Builder* crew at SPI booth 954 and enter our "I am a Solar Builder" contest!

AP ALTERNATIVES

AP Alternatives specializes in modular fixed-tilt ground mount systems. The standard 72-cell system is a modular system, meaning that the racking and solar modules are preassembled before they reach the site, making field installation very efficient. The racking system is constructed of high strength galvanized steel that has been engineered for maximum material utilization. AP Alternatives' standard 72-cell system will accommodate any 72-cell solar module and is applicable for most site conditions including high wind loads, heavy snow loads and differences in topography. Visit AP Alternatives at SPI booth 2034 to learn more.



ARRAY TECHNOLOGIES

Array Technologies' DuraTrack HZ single-axis solar tracker delivers proven performance with extraordinary durability for utility-scale and commercial projects. Employing a proprietary rotating gear-drive system with fewer motors per megawatt, the DuraTrack HZ system reduces installation time and costs with less structural material than other trackers. With its high installation and grading tolerances, the flexible DuraTrack HZ tracker can be deployed on undulating terrain and within irregular site boundaries. The DuraTrack HZ system is the industry leader in solar tracking, with more than 1.5 GW shipped and installed worldwide. Visit Array Technologies at SPI booth 1039 to learn more.

BONFIGLIOLI

Bonfiglioli designs and manufactures a number of products for the North American utility-scale PV market. The PV product portfolio is designed to shorten the field installation schedule and maximize system uptime, for higher long-term profitability. The RPS Station, a fully integrated, climate-controlled PV power conversion system, is factory-assembled and delivered cabled-ready for simple “drop and play” installation and quick operation. Complete with Bonfiglioli RPS TL-UL inverters and pad-mounted oil-filled transformer, the modular design supports power ratings from 1.0 MWac to 2.8 MWac and can withstand any environment, to meet even the most demanding requirements. Visit Bonfiglioli at SPI booth 1617 to learn more.



CERTAINTEED

The CertainTeed Solstice Solar Roofing System features rack-mounted highly efficient PV panels in an aesthetically pleasing style, with black cells laminated to a black back sheet and mounting frame. Each durable, easily installed 47-lb module contains 60 high-efficiency monocrystalline solar cells, producing a maximum electric power rating of 250 watts per module. The system is available in AC and DC versions. Each kit contains the panels, racking, mounting clamps, flashing accessories, inverter and an optional monitoring system. Solstice is also backed by one of the most comprehensive warranties in the industry. Visit CertainTeed Solar Roofing at SPI booth 2509 to learn more.

CHINT POWER SYSTEMS AMERICA

Chint Power Systems has two new string families on display at SPI.

3-phase: 23-kW and 28-kW, 1,000-Vdc models, shipping now with dual-independent MPPTs, integrated DC fusing, DC/AC disconnects, arc-fault detection, NEMA4, 300- to 900-Vdc range and 98% CEC efficiency. Ideal for commercial and utility applications, displacing large central inverters based on design flexibility, efficiency and lower installed cost.

1-phase: 3-, 4-, 5- and 6-kW family designed and developed in Texas; the 4-, 5- and 6-kW models include dual MPPTs while all models have optional Ethernet/ZigBee communications, arc-fault detection, integrated DC/AC disconnects and fusing. CEC efficiencies up to 97% enable a high reliability, long-life fan-less design. Visit Chint Power Systems at SPI booth 4016 to learn more.



DECK MONITORING

The popular DECK Monitoring solution is now available for residential solar projects at a great price. Customers get the key benefits of the DECK Monitoring solution with just one device: the I-210+c socket meter from GE. This meter includes a cellular modem, so installers won't have to deal with communications wiring and IT connections. It also includes a five-year data plan from Verizon Wireless Services for a true “plug and play” experience with installation and deployment. A full installation may be accomplished in as little as one hour. Visit DECK Monitoring at SPI booth 4219 to learn more.

DPW SOLAR AND BAJA CONSTRUCTION

DPW Solar and Baja Construction announce their new SR Series solar ready shade structures engineered and optimized to site specific applications. The structures feature an integrated PV module mounting system and are available in a variety of structural types and finishes. These solar support structures feature tilt angles up to 10° and optional solutions for water and snow protection. The integrated module mounting system features high strength Power Rail components including the RAD clamping system and certified integrated grounding. PV module mounting is available in portrait, landscape or side-tilt orientations. Baja Construction offers professional, code approved installation services of the SR Series structures for locations anywhere throughout the Americas and abroad. Visit DPW Solar at SPI booth 2807 and Baja Construction at SPI booth 4054 to learn more.

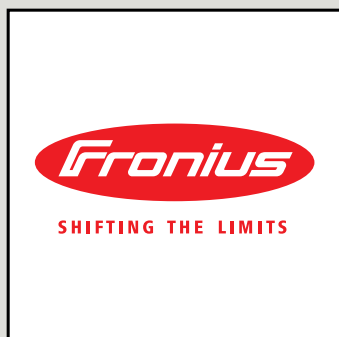


EATON

Eaton is making cost-effective, reliable solar generation a reality for utility, commercial and residential customers with a complete portfolio of balance of system (BOS) solutions. Engineered for safe, efficient and reliable operation, Eaton equipment and live product demonstrations will be display at two SPI booths. With expanded engineering services and solutions resulting from the acquisition of Cooper Industries, Eaton solutions are helping the industry maximize solar harvest, reduce installation costs, maintain reliable operations and enhance safety. Visit Eaton at SPI booths 1648 and 1655 to learn more.

ECOFASTEN

GreenFasten by EcoFasten Solar is the most cost-effective solar roof mounting system on the market for composition shingles. GreenFasten assures three levels of watertight protection with a patented watertight seal. GreenFasten can be used on new or retrofit installations, without removing shingles. Easy install with a single lag bolt or even faster installation with a self-drilling fastener. GreenFasten and all EcoFasten Solar mounting solutions can be viewed at ecofastensolar.com. All cut sheets and install instructions are available online for download. EcoFasten Solar designs and manufactures solar mounting solutions for all roof types. All products are made in the United States. Visit EcoFasten at SPI booth 3149 to learn more.



FRONIUS USA

Fronius USA LLC is the North American sales, support and distribution center for Fronius International GmbH. Specializing in energy conversion technologies, Fronius has more than 65 years of experience and employs more than 3,500 globally. Fronius has developed a revolutionary inverter concept that is used for both grid-tied as well as European stand-alone solar systems and has more than 350,000 Fronius solar inverters installed worldwide. Fronius USA will be launching its newest editions to the Fronius inverter family as well as highlighting its Fronius Service Program at SPI. Visit Fronius USA at SPI booth 625 to learn more.

GROSOLAR

groSolar is celebrating 15 years in business! Since 1998, groSolar has been dedicated to high quality, on-time, and on-budget project performance as this company has focused on providing commercial and utility scale EPC services to its clients. groSolar's team has experience working intimately with developers, investors, project owners, subcontractors and other partners on multi-megawatt projects from the routine to the complex. Its portfolio contains installations on brownfields, capped landfills, open waste water treatment tanks, commercial and educational buildings, agricultural sites and undeveloped land and manufacturing facilities. Visit groSolar at SPI booth 4522 to learn more.



INTERTEK

Product failure or less than anticipated performance can result in lost dollars and a tarnished reputation. As a result, bankability testing has become a key sales driver in the solar industry as bankability assessments of PV modules help companies evaluate the long-term performance, reliability and durability of their PV systems. As a leading global testing and certification company, Intertek is one of the first companies to offer bankability testing, which helps companies attract investors and gain subsidies from banks or government entities and ultimately gain a competitive advantage in the marketplace. Visit Intertek at SPI booth 3013 to learn more.

MK BATTERY

The renewable energy industry is excited about “energy storage” and the development of new products and technologies that will allow consumers to store electricity for numerous applications. MK Battery invites you to stop by its booth and discuss your specific requirements. MK Battery would also like to present its current platform of DEKA Solar products with the new enhanced cyclic GEL 4D and 8D batteries as well as its high capacity Unigy II platforms. Both of these products, if properly designed and integrated into an approved system, will allow the end user to migrate to new technologies as they are developed. Visit MK Battery at SPI booth 3827 to learn more.



PATRIOT SOLAR GROUP

Patriot Solar Group (PSG) of Albion, Mich., will be showcasing its innovative Ballasted Ground Mount at Solar Power International this year. This mounting system makes it possible for solar arrays to be placed in areas that were previously “off limits” (such as brownfields and landfills), where penetrating the ground is not an option. It also solves a problem that can stifle a solar development by allowing one to place a ballasted mount in an area with challenging soil conditions (such as underground rocks and boulders) that make it impossible to drive a post into the ground. Visit PSG at SPI booth 1056 to learn more.

QUICK MOUNT PV

Quick Mount PV produces 100% code-compliant, waterproof solar roof mounts. Founded in 2006, the company pioneered roofing best practices in the solar industry and provides ongoing training and education. Quick Mount PV offers mounting solutions for composition/asphalt shingle, tile and other roof types. The Classic Composition Mount utilizes patented waterproofing technology — the QBlock Elevated Water Seal — for unsurpassed protection against leaks. Ideal for tile roofs, the Quick Hook USA is the industry's first flashed tile hook mount, offering superior aesthetics and waterproofing for curved and flat tile roofs. All products are made in the United States. Visit Quick Mount PV at SPI booth 2815 to learn more.



RENNSTEIG TOOLS

Rennsteig engineers develop tailor-made, high quality tools for a wide variety of applications and industries that meet and often exceed all quality parameters. New on the market is Rennsteig's eForce - Battery Powered Crimping Tool. This tool is specially designed for all industries. It comes with one or two Li-Ion batteries in a heavy duty portable plastic case. With this tool you can use all existing Rennsteig Die Sets and Locators. This means it is 100% compatible with the Die Sets of Rennsteig's Crimp System Tool PEW 12 and the Crimping Machines CM25. Visit Rennsteig Tools at SPI booth 2453 to learn more.

SOLAR BUILDER

Your favorite construction-based solar magazine has some big plans for SPI. The new "I am a Solar Builder" campaign will be unveiled at the show, gearing up for an exciting 2014. Show your contractor pride by picking up some swag and entering to win our free money giveaway.

In upcoming issues, we will feature North America's great solar builders, highlighting their stellar work. From two-panel home installations to multi-megawatt fields, every solar project encourages further development. Visit *Solar Builder* at SPI booth 954 to learn more.



SNAPNRACK

SnapNrack, a manufacturer of innovative PV Mounting Systems, is continuing to help reduce installation time and costs by introducing a new product to its Series 100 racking system, the Metal Roof Base. A few new features of the Metal Roof Base include a self-sealing mounting base that can be used on common corrugated profiles, compatibility with existing SnapNrack components, and a 5/16-in. stud that has been tested to withstand more than 4,000 lbs of uplift force. The base simply seals to the roof with a recessed EPDM Rubber Washer, and the cap seals over the top of the bolt. The Metal Roof Base adds ease of installation and reliability over the service life to any system. Visit SnapNrack at SPI booth 2812 to learn more.

SOLAIRE GENERATION

Solaire Generation, a market leader for integrated solar parking structures, recently brought to market its latest carport solution — the Long Span 360. The Long Span 360 covers two parallel parking rows and the internal drive aisle with one contiguous PV-covered canopy. Designed to efficiently maximize any parking lot's solar production, the customizable structure can be up to 110 ft wide and was recently chosen for a 1.5-MW installation in Gainesville, Fla. The Long Span 360, like Solaire's other patented canopies, is available as a single or dual-incline canopy with an optional water management system. Visit Solaire at SPI booth 3108 to learn more.



SOLECTRIA RENEWABLES

Solectria Renewables introduces the next generation of SMARTGRID inverters, optimized for high efficiency, reliability and economy. Available in two power classes, 500-kW and 750-kW, these inverters are designed for direct connection to an external transformer for utility-scale applications. These outdoor rated inverters can also be configured as 1.0- or 1.5-MW Solar Stations. Available utility-scale options include a plant master controller and advanced grid management features, such as real and reactive power control and voltage and frequency ride-through. Listed to 1,000-Vdc, with a CEC weighted efficiency of 98%, the SGI 500/750XTM inverters set a new standard for large scale power conversion. Visit Solectria Renewables at SPI booth 431 to learn more.

SUNLINK

With more than 300 MW of Large-Scale GMS to be installed over the next 12 months, SunLink is able to provide the lowest cost solution for ground mount projects of 500 kW and larger while maintaining the highest quality and customer service. SunLink's Large-Scale GMS features cutting-edge structural engineering and product design that translate into lower cost in large-scale projects. The system offers maximum racking flexibility, efficient design, site-specific optimization and only six components for ease of assembly. In addition, Large-Scale GMS was specially designed to make the mounting of prepanelized three- or four-panel columns as fast as possible whether using SunLink provided mechanical equipment or manual lifting. Visit SunLink at SPI booth 1310 to learn more.



SUNMODO

Sunmodo Corp., a Washington-based solar panel mounting company, was formed with the mission of providing the best value solar racking and mounting solutions for solar power systems. With minimal parts, easy installation and versatile design for unlimited configuration, Sunmodo offers one of the fastest, easiest and most cost-effective solutions on the market today. Sunmodo is developing its fully rail-less pitched roof solar mounting system that uses significantly less material than a traditional flush mount system with rails. Sunmodo will showcase its rail-less products at Solar Power International. Visit Sunmodo at SPI booth 2546 to learn more.



1



2



3

1

Lifeline Data Centers announced plans for a massive 4-MW install on rooftops and parking canopies at its Indianapolis campus. The panels will allow the site to replace its power consumption entirely with solar energy.

2

Affordable Solar recently completed a 45-kW system on the roof of the International Indoor Soccer Arena in Albuquerque, N.M. The system uses Trina Solar modules, Solectria inverters and a Unirac mounting system.

3

Companies and communities across the United States announced at least 58 clean energy and clean transportation projects in the second quarter of 2013 that could create as many as 38,600 jobs, according to a report released by the nonprofit business group Environmental Entrepreneurs (E2).

The Q2 2013 clean jobs total number is slightly higher than the 37,400 jobs that E2 tracked in the comparable quarter in 2012. For the first time, both Hawaii and Alaska ranked in the Top 10 states to announce clean energy projects in the second quarter of 2013.

California ranked first with more than 9,000 clean energy jobs announced in Q2; Hawaii was second with 5,000 jobs; Maryland third with 4,400 jobs; Illinois fourth with 3,400; and Oregon fifth with more than 3,000.

Solar generation projects accounted for more than 10,400 jobs announced in Q2. Solar jobs grew nationwide, from California to North Carolina.

More information on the growth of solar and other clean energy jobs are detailed on the website cleanenergyworksforus.org.

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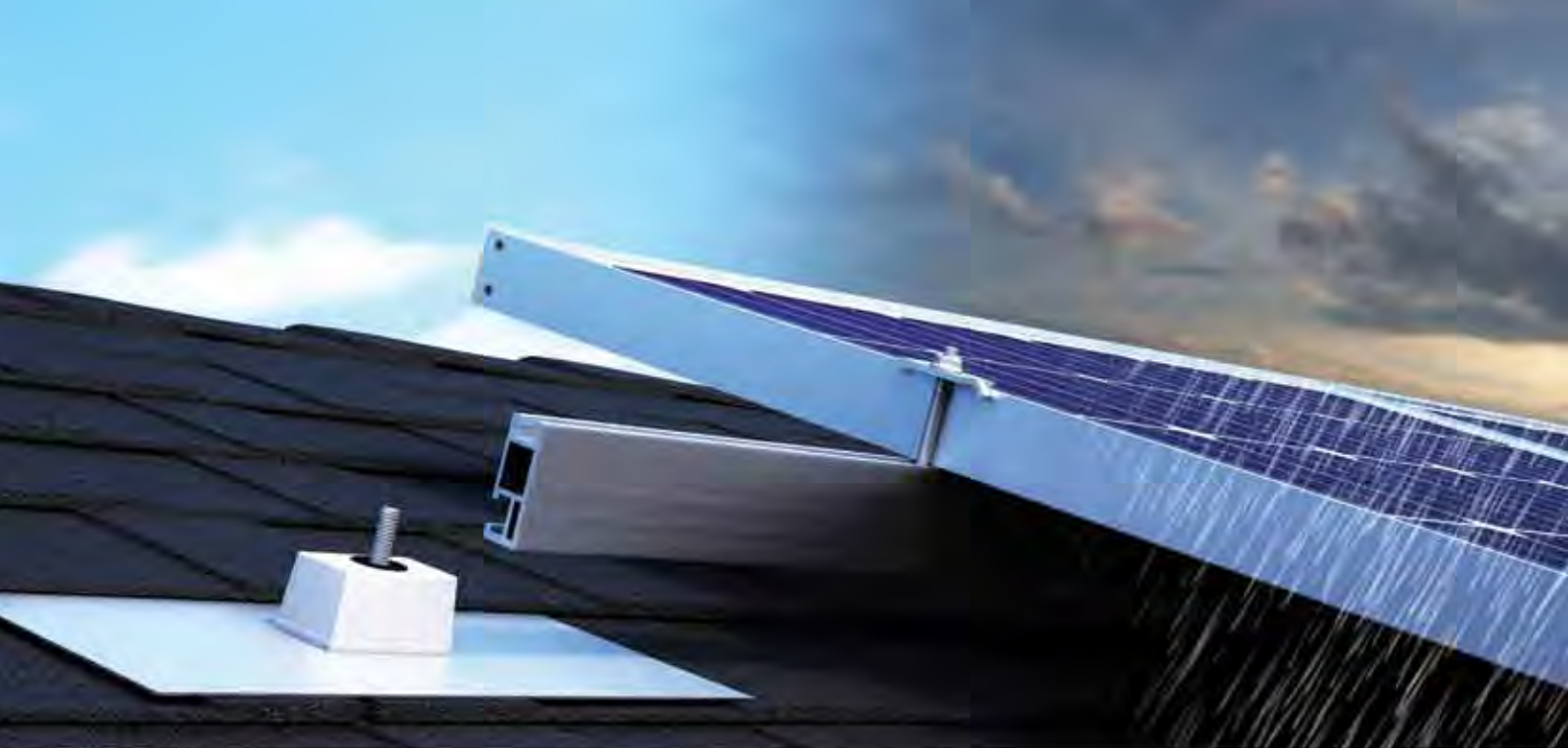
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See how our patented QBlock technology prevents future roof leaks at quickmountpv.com/noleaks

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