

## Mounting Tech Trends: Slimming Down on Parts, Problems, and Prices

by CHRIS CROWELL

Andrew Worden, CEO of GameChange Racking says:

“The days of high part counts are gone as utility-scale plant costs approach \$1.30 per watt in the southeast now.” The changes are driven by simple, fast installation systems with minimal components that reduce total system cost. By achieving these price drops, solar technology now makes sense on many sites where cost was once prohibitive, with total cost dropping from \$2 per watt to nearly \$1.50 per watt for large sites, according to Worden. One option here is cast-in-place concrete for ballasts, which has become a prevalent choice for cost & install speed reasons.

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### Mounting Tech Trends: Slimming Down on Parts, Problems, and Prices

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The story of solar mounting technology is a familiar one, in which original technology is slowly replaced by newer options that improve upon certain aspects of the original. Where the initial equipment was focused on establishing a viable product to build on industry, the next wave of trends works to improve, yet simplify what's already been established. In speaking with dozens of mounting technology companies, this picture emerges. More competitive regulations with multiple pieces are streamlined and costs come down, all of which have certain project headaches for contractors. Let's look at some of these trends specifically, and what you should be thinking about before starting your next project.



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#### Preassembly

According to multiple manufacturers, preassembled and pre-wired commercial racking solutions are hitting the market and delivering a sizable level of efficiency for any installation while providing installers with a comprehensive, commercial-scale system solution.

“They are the fastest, easiest way for installers to deploy decentralized, commercial rooftop systems,” says Brad Cook, director of marketing for SMA America. “They include all balance of system (BOS) components and can be assembled in minutes, simplifying and speeding project completion.”



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When paired with an advanced three-phase inverter, these racking solutions offer design flexibility, high efficiency, enhanced safety and full grid management features. “Contractors are increasingly looking for products they can understand and quickly master to reduce on-site time and costs,” says Andrew Savage, chief strategy officer for AllEarth Renewables. “There has been a notable evolution on mounting products that strive to speed up install time at the jobsite.”

For commercial mounting technologies, financiers are becoming more interested in turn-key products that do not require a new spec for each deal, and turn-key projects they can sell off to investors with low transaction costs.

#### Universality

Modularity and standardization are keys to the latest mounting technology developments. These trends are driven less by the need to improve the function of the technology and more by the needs of the client. Essentially, a standardized or universal mounting application will lead to a more consistent, repeatable installation process, with fewer project-to-project variations and fewer installation questions.

“A quick, reliable and safe installation process is important to reach time-sensitive installation schedules,” says Martin Beran, head of system support at Fronius USA. “Mounting systems that provide a common installation procedure throughout the product portfolio of a manufacturer ensure high quality, even when performed by inexperienced personnel.”

A universal solution includes a wide range of mounting orientations, that can be utilized on different surfaces (brick, wood or stucco) as well as racks (for port, roof mount or free standing) and with one-size-fits-all inverter racking. With a universal mounting option, there is less of a chance to encounter a situation that will need troubleshooting during an installation.

#### Simplicity and Speed

Mounting is getting lesser and meaner. The need for universality and preassembly have also led to simpler designs. Beran mentioned that today, high power density leads to lightweight devices that can be easily lifted, installed and serviced by small crews. Fully integrated sub-inverter options, such as string boxes and DC disconnects, reduce BOS and labor cost.

“Mounting technology should be easy to install; no special tools or hardware should be required. Small crew size, ideally one-person-only requirements for pre-installation and/or mounting the inverters,” Beran says. “Self-explaining products and intuitive installation procedures ensure high quality of work, long-lasting systems as well as production performance.”

Some of these mounting technology advances are a result of improved inverter technology. Utility inverters no longer require massive skid solutions, which can be costly to transport and ship.

“Inverters are being manufactured with such a high degree of integration that a simple three-piece solution consisting of the inverter, medium voltage transformer and bus bar connection can be assembled on site,” Beran says. “A simple concrete pad can be poured where the kit is assembled. With these advancements in utility inverter mounting, EPCs and construction companies are seeing significant cost savings through the reduction of transportation, logistical and field labor costs.”

Improvements in solar trackers are helping developers, OEMs, EPCs and system owners overcome issues in terms of

layout constraints, an excessive number of foundations and needing too much expensive steel. Some solar project developers are focusing on a tracker-centric strategy for ground-mounted systems to improve project economics, according to Alex Au, chief technology officer for ACETracker, who forecasts showing more than two thirds of utility-scale projects incorporating trackers by 2015. Au says the latest innovation here is for the tracker to use integrated solar power to move the array, enabling them to power themselves using small, dedicated PV panels. Some include a backup battery in case PV power output is lost, which removes the need for a separate, costly backup uninterruptible power supply system.



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And of course, like many other products that started out as a metal-only solution, plastic applications are hitting the market to offer a further simplification.

“Plastic has had to overcome much discrimination, but because of engineering, testing and especially successful case studies, plastic is here to stay,” says Christopher H. Genco Jr., R&D specialist with Kanon.

#### Price Point

“The days of high part counts are gone as utility-scale plant costs approach \$1.30 per watt in the southeast now,” says Andrew Worden, CEO of GameChange. The changes are driven by simple, fast installation systems with minimal components that reduce total system cost. By achieving these price drops, solar technology now makes sense on many sites where cost was once prohibitive, with total cost dropping from \$2 per watt to nearly \$1.50 per watt for large sites, according to Worden. One option here is cast-in-place concrete for ballasts, which has become a prevalent choice for cost and install speed reasons.

“For utility and commercial segments, we continue to see market pricing being driven down to unprecedented levels,” says Steve Daviel, EVP of sales and marketing at Solar Flexback. “In order to stay competitive, all mounting systems must continue to find cost reductions through product innovations and appropriate usage of materials.”

According to Daviel and other manufacturers we talked to, those cost reductions come from optimizing materials and reducing components — many of the trends discussed earlier.

“I think contractors need to be more aware about what they are buying,” Genco says. “With technology rapidly emerging in the mounting space, plenty of companies are making promises they cannot keep. Become familiar with a racking company — what they do and what they offer. Look for something well engineered, but easy to use and install.”

Speed and efficiency of a project can often come down to the module interface bracket (MIB) due to the amount of labor associated with module installation. Mike Onrhan, director of sales for Array Technologies, says there are MIBs now that use only one single-bolt bracket per module, which can glide easily onto the tongue rail and be ready for module installation. Systems that have independently drive rows with no central drive brackets can provide a lower operating cost, according to Au, because there are fewer moving parts to maintain.

“Two 60-module rows can be turned toward one another, such that 100 panels can be cleaned in one pass, versus 20 to 30 panels per pass in a tracked row tracker,” Au says.



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Each project site is different and specifics like land variability, labor markets and logistics need to be taken into consideration. Custom solutions that appropriately match any project type can enable developers and EPCs to successfully complete projects on time and on budget. But at the same time, Savage says many contractors can lose sight of all the other costs involved when designing custom systems and procuring the necessary equipment.

“As margins get thinner and competition for a sale increases, any mounting solution that helps incorporate both design and procurement will help boost the profitability of these companies,” he says. “This will become even more acute of an issue if there are reductions to the ITC in the coming years.”

Contractors have realized they need to account for more than just racking material price and look at the total cost of implementing an installation, taking into account material, mobilization, delivery, logistics and installation costs. So, any technological solutions that provide ease of installation, adjustability and generous tolerances for field assembly all contribute to the overall project cost and probability of success, according to Daviel.

“Services to accompany the racking are very important,” he says. “Factors offered by the racking supplier like level of project management, field installation training and ongoing support must be considered. There are a number of hidden costs if a contractor is buying on price alone, which can have a detrimental effect on project cost and level of success.”

Chris Crowell is managing editor at Solar Builder.