

## **PIPEDREAM BECOMING A REALITY, BLYMYER ENGINEERS CRAFT FIRST-EVER 1,500 VOLT PV SYSTEM. WILL 1,500 VOLT ARCHITECTURE BE THE FUTURE OF SOLAR?**

ALAMEDA, Calif., April 18 2016 /PRNewswire/ -- Blymyer Engineers, the nation's leading solar design firm, announced today the company is finishing the designs on a 1,500 volt PV system across three sites in Florida. When completed the Gulf Coast project will generate 123.75 MW of AC power.

The project is utilizing 1,497,000 First Solar thin film modules on AET fixed tilt racks, and since the site is adjacent to the Florida shoreline the entire project must be able to withstand massive hurricane winds. Swinerton Builders is the EPC contractor of record on the project developed by Gulf Coast Solar. The project is planned for completion in late 2016.

The Florida 1,500 volt project is a first for Blymyer Engineers. The utility solar market is undergoing a significant transformation as demand grows for solar power. According to Mike Rantz, president of Blymyer Engineers, "we're seeing the beginnings of a transition to 1,500 volt DC systems, which is a significant change for the market. There was a big movement from 600 volt to 1,000 volt systems in 2012 and 2013, and now we're seeing another evolution to these 1,500 volt projects as the supply chain starts to scale and the high-voltage value proposition is recognized. In these higher voltage projects the balance of system (BOS) requirements are lower, strings are longer allowing for fewer combiner boxes, less wiring and less trenching—all which drive PV system costs down. UL has updated many standards to provide a means for manufacturers to list their products in compliance with the NEC and we'll see more of this as market demands brings these projects to the table."

According to industry sources, 1,500 volt systems are expected to account for 9 percent of the worldwide utility solar installations this year (GTM Research, Solar Market Analysis, Scott Moskowitz Solar Analyst). GTM also indicates "the average cost for a 20 MW fixed tilt utility project in the US in 2015 was just above \$1.50 per watt, which could be viewed as relatively inexpensive." But given the current landscape record-low PPA signings, component costs are more closely watched because they can ultimately make or break a project. GTM research suggests installing 1500 Vdc systems, instead of now standard 1,000 DC, could lower costs by \$0.05 per watt.

Prior to 2013 most of the systems in the US were installed at 600 DC, while Europe was already comfortably working in 1000 DC. Testing standards have been a barrier to 1,500 volt projects in the US, and the availability of 1500 volt manufactured components has been limited. Now manufacturers throughout the supply chain are starting to cater to this voltage ramp-up which lowers BOS costs and subsequently LCOE. Blymyer Engineer's Director of Engineering Greg Mazur notes, "1,500 volt systems allow for a 50% increase in the number of modules on a string, and reduce the quantity of equipment used to aggregate the DC power of the array. The higher the voltage allows more power through equal

sized conductors. It results in less voltage drop, and the power electronics uptake much more efficiently. The upshot is we can design higher voltage systems with longer strings, that's where the cost savings in BOS kick in." Theoretically, even more modules can be combined into the string and there will be fewer strings for the same array capacity.

Blymyer's Rantz says his company has the engineering expertise to handle these new technologies and he's already looking to future technological advances. "As engineers we're always looking at the next breakthrough technology. We're highly interested in new developments in storage. The near future might see the use of three phase string inverters and utilization of next-generation silicon carbide components which would allow for much greater power densities and switching frequencies."

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