Brutally Cold Winter Can’t Stop Completion of Wisconsin’s First Utility-Scale Solar Energy Project

S&C Featured Solution: Solar Generation Interconnection
Location: Jefferson, Wisconsin

Customer Challenge
Wisconsin’s Renewable Portfolio Standard stipulates that, by 2015, 10 percent of the state’s power must come from renewable energy sources. Although wind generation would seem to be the best way to achieve this goal, solar offers an excellent alternative. Wisconsin has an average solar insolation of 3.69 kWh/m²/day... higher than most of Germany, a county with over 36 GW of solar generation, that currently leads the world in solar integration.

Half Moon Ventures LLC. (HMV), a local developer, was committed to creating Wisconsin’s first utility-scale solar farm. They chose the city of Jefferson as the ideal location for the 1-MW project, and established a contract with WPPI Energy—a local wholesale power supplier—to purchase the power generated by the farm. The power would be sold to a group of 50 locally owned, not-for-profit utilities which includes, Jefferson Utilities, the city’s municipal utility. HMV then proceeded to procure 3,654 polycrystalline solar panels, which provide superior performance in colder climates.

But a couple of major obstacles had to be overcome: to maximize HMV’s return on investment, the project needed to be completed by the end of the 2013. And, further, the project needed to include substantial local content.

S&C Solution
Recognizing S&C Electric Company’s in-depth expertise in completing similar projects, HMV selected S&C to deliver their solar project on an EPC basis. With an engineering office in Franklin, Wisconsin—staffed...
Brutally Cold Winter Can’t Stop Completion of Wisconsin’s First Utility-Scale Solar Energy Project

with Professional Engineers licensed in the state–S&C was well suited to perform the project engineering, procurement, and construction . . . while keeping HMV's vision and priorities in sync with the rest of the project team.

To assure on-time completion of the project, S&C prepared a detailed critical-path schedule for use by S&C's internal teams and subcontractors. With S&C as the primary solution provider, phases of the project could overlap to reduce the time to completion. Long-lead-time components such as the two 500-kVA interconnection transformers were purchased by S&C's procurement team during early design phases of the project, to assure they arrived on-site exactly when needed.

S&C's System VI™ Switchgear was furnished for the interconnection to Jefferson Utilities' 24.9-kV distribution system. This unique gear combines S&C's utility-proven Vista® Underground Distribution Switchgear for the switching and protection needs of the solar farm, plus bays containing metering equipment and protective relays. System VI Switchgear eliminated the need for multiple line-ups of gear, significantly reducing equipment footprint and cost.

Although S&C's project managers anticipated that most of the construction would take place during the winter months, they never envisioned the winter of 2013 would be the second coldest in Wisconsin history! With December temperatures of less than -10° F (-23° C) and an average temperature of 9° F (-13° C), driving poles for racking systems, pouring concrete, and splicing medium-voltage cable took much more time and, in some cases, required different methods of completion.

Daily review of the critical path schedule by S&C's project managers and construction crews assured the project moved forward as planned, despite the weather. To combat the cold and snow, S&C increased construction crew sizes, so while one crew worked, the other could warm up. To maintain the temperatures needed to effectively splice medium-voltage cables, temporary barriers were erected, each with its own heaters. After seven weeks of construction in bitter temperatures, S&C engineers and project managers worked hand-in-hand to oversee and coordinate commissioning and energization of the solar farm.

Valued Outcome

Despite the extreme conditions, S&C completed the solar farm two weeks ahead of schedule, with zero lost-time injuries. At the time of its completion, the project was the largest utility off-take solar energy plant in Wisconsin and was generating more than 1.5 million kilowatt hours of clean energy annually. Half Moon Ventures was delighted with S&C's execution of the project and ability to exceed expectations, on schedule and budget. The Jefferson Solar Farm is now part of the over 15 MWs of solar energy in the state that provides clean power to over 2,250 Wisconsin residents.

Utility interconnection utilizing S&C’s 27-kV System VI Switchgear.