

From **CORNFIELD** to **SOLAR ARRAY**



A solar project built by S&C Electric in southwestern Massachusetts for Lodestar Energy has seen a site that was previously used to grow tobacco and corn now producing solar power.

By Paul
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An interesting transition was recently made at a small piece of land in a corner of southwestern Massachusetts, as it went from producing a not-so-healthy product to generating a clean and green product.

In a matter of months, the 30-acre site near the small town of Southwick went from producing tobacco and corn to generating solar power, part of a larger move to producing clean energy in this New England state.

S&C Electric Company did not waste any time in getting started on the Southwick solar project for client Lodestar Energy, which is based in neighboring Connecticut.

At the beginning of the project, one of the challenges S&C faced in getting started was timing, determining when the last crop of tobacco and corn was going to be harvested, so they could start work on the site as soon as possible.

"I think our team did well with organizing that," said Dan Girard, S&C's director of EPC and Global Business Development. "The farmers harvested their crops on a Thursday, and we started construction on a Tuesday."

S&C's involvement with the 5.8-MW DC/4.0-MW AC project was far in advance of that though, and it allowed the company to move quickly, both on the planning side and construction side of the project. The company has a



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solid relationship with client Lodestar, having built 22 solar projects for them over the last four years.

The Southwick site, in a small section of southern Massachusetts that actually juts into northern Connecticut, is mostly rural. The nearest major center to Southwick is actually Connecticut's capital city, Hartford, about 25 miles to the south.

Since the site itself was already being used for farmland, there were no environmental issues to deal with.

There is a common feeder line that comes across wetlands to the two sections of the Southwick solar project. "But the utility tie-ins are on the other side of the wetlands from the site, so we did need to take that into account when planning for our overhead construction," said

Girard. "But we worked with the utility Eversource Energy on that."

The project site consists of two solar arrays—Southwick North and Southwick South. Very little was required in terms of site prep after the landowner removed the tobacco farm racking and corn stocks from the site. "The client's civil construction team ran a dozer over it a few times doing some cut and fill and blading, but the site was already fairly flat," says Girard. "It was a good site, and we had reasonably good

soil conditions. We only had a few refusals in driving steel for the foundations for the racking.

"We thought we would not have any refusals," Girard added. "But we came across a rock ledge that runs through the northwest section of the site. In the end, we only had seven post refusals, which is pretty minimal compared to the number of posts that had to be driven." A total of 1,888 posts were driven for the project.

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S&C and its fellow electrical contractor, Massachusetts-based Pro Star Electric Inc., started work on the north array and basically rolled out construction operations from there.

"Our construction teams followed a detailed construction schedule, systematically addressing scopes of work in order of their completion milestones. They worked very hard to make sure that this part of the project proceeded smoothly."

Having a hiccup could back up the whole process, Girard says. "For us, and for our contractors, it's a lot easier if we have a very good plan of attack."

There are a lot of moving parts to building a solar power project, and it's important to make sure all those parts are meshing together.



"It involves a lot of meetings," says Girard. "Whether it is in the details of updating suppliers on when we need materials, to the big picture logistics of managing a major construction project site."

Girard notes they had a three-week look-ahead schedule that complemented the construction schedule and provided a more detailed view as to what was to take place over the current week as well as the next two weeks. In addition, the managers also held weekly construction meetings where they ad-

ressed any open items that may have been present on the site, and they discussed completion of certain tasks based on their milestone dates.

"I give a big thanks to our production team, our project managers, and construction managers because they are the people who handle things every day and keep things moving forward," he says. "Such people are, as the saying goes, the boots on the ground."

He adds, "It is truly a team effort that includes the help of our contractors as well."

Massachusetts: a leader in solar power

Massachusetts has demonstrated its leadership in renewable energy over the last seven years.

To date, Massachusetts has added over 2,000 MW (2 GW) of solar power generation facilities. This staggering growth places Massachusetts in fourth place in the U.S. behind only California (>13,000 MW), Arizona (~2050 MW) and North Carolina (~2100 MW). And Massachusetts is about to move into the #2 position upon the release of its most ambitious program yet—the Solar Massachusetts Renewable Target (SMART), which will add an additional 1,600 MW.

Massachusetts has accomplished this monumental feat through the significant efforts of the Department of Energy Resources (DOER) and its engagement with all relevant stakeholders. SMART is a thoughtful balance of policy and market economics and what many believe will be a sustainable solar incentive program that promotes cost-effective solar development in Massachusetts for all stakeholders.

SMART has replaced the virtual net metering credits utilized in the SREC I and II programs with baseline prices for electricity generated in several utilities. The rates were created through a reverse auction in which project developers competitively bid projects into the program to establish the rate structure. Based on the initial auction in December, there will be successive declining "blocks" that will reduce the initial rate by four percent per block from the original rates, upon achievement of specific thresholds.

Additionally, SMART creates a number of "adders" and "subtractors" that provide additional value that can be added onto the base rates. These "adders" and "subtractors" are also established in predetermined amounts and will be allocated on a first-come basis.

Examples of "adders" and the corresponding value per kwh include:

- Community Solar (.05)
- Brownfield utilization for sites (.03)
- Landfill utilization for sites (.04)
- Low-Income Offtakers (.03)
- Solar Canopies (Auto or Agricultural) (.06)

An example of "subtractors" and the corresponding value per kwh is Utilizing Prime Agricultural Land or Core Forest (.001 per acre of land used).

Finally, SMART has created a framework to incentivize the deployment of energy storage co-located with solar generation facilities. The framework has created a solar-plus-storage working group to help shape and implement the program. This incentive provides a very forward-looking framework that could help diminish the need for the construction of peaking plants, increase the resiliency of the grid for local communities, and assist the ISO in complying with the FERC Order 755 mandate. ●

With Lodestar, S&C has an agreement in place as to which contractors they will use, maintaining a short list of approved companies, including preferred contractor Pro Star Electric, who was hired for the Southwick project.

"It's not only price and availability, but also quality that determines between us and Lodestar what contractor we are going to hire," he explained. "Massachusetts is a very busy place, construction-wise, for solar. When we get a good contractor and crew, we try to hang on to them because good crews deliver the best product."

There are a lot of moving parts to building a solar power project, and it's important to make sure all those parts are meshing together.

And in terms of materials, Girard said they generally work with about four different racking companies.

"On the Southwick project, the team chose GameChange for our racking needs based on the site conditions and soil type, and it made more economical sense based on these conditions."

Chint Power Systems string inverters (36kW, quantity:108; 28kW; quantity 4) were used on the project, and a total of 17,964 Jinko panels were used (a mix of 320W and 325W panels).

In terms of materials storage, they were able to use part of the Southwick site for laydown of materials and equipment, with material deliveries well coordinated.

"Our construction managers coordinate with our procurement team and suppliers to develop delivery schedules that help minimize disruptions in traffic and mitigate com-

plaints from neighbors."

Massachusetts, along with the northeastern part of the U.S., got hit with some wicked weather earlier this year, with one Nor'easter winter storm after another.

"Our construction teams worked through the storms, taking necessary precautions for employees' safety and health," said Girard. "We attempted to beat the freeze and ended up starting at the same time the freeze hit.

"It got worse towards the end of

the year, but we had already driven steel and had dealt with the refusals at that point. So we were pretty well set and ready to install panels."

Installing solar panels during bad weather is no picnic, says Girard, but it's not as difficult as driving steel posts in snow and heavy frost. "Those Nor'easters can back everything up. It definitely slows down production, whether you get six inches or sixteen inches.

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"We were hit with a barrage of weather fronts that included snow, sleet, and rain continually throughout the project."

S&C and its contractors pretty much work with whatever they get, weather-wise. Girard says safety is always their number one priority, and their construction managers are very mindful about when to adjust construction work.

That focus on safety is just one of the attributes that S&C brings to the solar projects they work on, says Girard—including local knowledge.

"We also keep very good tabs on what is going on in the states—we work in 36 out of the 50 states. When a company like Lodestar comes to us, we can advise them on what we believe will work well in a state and in an area."



Helping that out are the relationships S&C has with government bodies, like local utilities and the Department of Energy Resources in Massachusetts. "We can assist clients with what is going to be required to do the interconnect in an area, and what kind of equipment and tradespeople are going to be required. I think we bring a more well-rounded approach than a lot of companies," says Girard.

That well-rounded approach certainly paid off with the Southwick solar project—S&C and its contractors achieved the milestone of Mechanical Completion three weeks early.

Other milestones, such as Substantial and Final Completion, are also on track.

That means in less than a year from walking the property when it was still in tobacco and corn, S&C has Completion of Construction, and Massachusetts has a new solar project, increasing the amount of renewable energy produced in the state.

Energization for the Southwick project is set for the third quarter of 2018 due to the high demand for interconnect and high number of solar projects currently in the state. ●