

# CASE STUDY

## Site Evaluation for Under-performing Solar



### OVERVIEW

Sunfarm Solar, LLC had five sites that were producing significantly less energy than forecasted. All five (5) systems are over 600 KWDC for a total of 3.2 MWDC. The client expressed concerns about the solar sites and whether they were thoroughly commissioned, along with uncertainty about impact from the utility side of the system. Sunfarm lead several efforts to diagnose a variety of potential issues affecting production but found that a deeper knowledge of the solar system and utility grid was necessary to effectively explore and diagnose their production concerns.

**“Sunfarm Solar purchased several large ground mount solar projects in Massachusetts late 2017, with prior EPC agreements and installs well underway. Once brought on-line, one 3.2 MW site in Pittsfield was significantly lagging in generation, in spite of the recommendations and remediation efforts of the engineers, contractor and grid operator. RLC Engineering was referred to us, and after our initial consultation and subsequent discussions we felt very confident in their capabilities and approach. As a direct result of RLC’s services, this system is now generating at /or above expectations. In the event we have additional engineering needs for this system, RLC is a valuable engineering resource given their experience and familiarity with our site.”**

– Thomas Garcia, CFO Sunfarm Solar

### THE APPROACH

- Evaluated the client’s Data Acquisition System (DAS) information and setup
- Performed I-V Curve Trace Testing on all 5 sites – this provided key information to immediately troubleshoot problem combiner boxes and PV strings
- Collected and analyzed settings and event data from each site relay
- Developed revised Record drawings for the 5 sites-originals were inaccurate and incomplete

### THE CONCLUSION

The client initially sought us to troubleshoot large-scale system problems, though more detailed conversations revealed that the site’s DC components had not been thoroughly tested and commissioned to date. We ran I-V Curve Trace tests for all PV strings on the five sites, which alone provided information to directly identify a number of problems affecting production. We resolved a variety of issues while on site that first day to increase production immediately. RLC’s findings included several shattered glass PV modules, PV strings that had never been connected, PV strings with loose MC4 cables and connections, and a failed arc flash circuit that prevented any energy output from one combiner. Also discovered was a large number of loose screws on the fuse block incoming and outgoing terminals for PV strings in the combiner boxes, which were causing lower production and electrical hot spots – a serious fire hazard. As a result of RLC’s O&M work, beyond production increases, the client received Tested and Commissioned systems with written report information that provides a performance benchmark going forward. The client also gained confidence in that repairs to their equipment resolved perceived utility-side issues. The initial one-day trip delivered an instantaneous increase in overall energy production for the 2.5 MWAC project, yielding a 6-month payback. As a result of our work, these five solar systems have outperformed another client-owned site that had previously been the consistent top performer.