

SolarEdge Optimized Solution Chosen for Repowering Low Voltage Commercial Ground Mount Installation in Japan

Since its launch in 2012, the Japanese Feed-in Tariff scheme has driven significant growth in the solar energy market, encouraging a growing number of system owners to take advantage of attractive pricing to go solar.

With many system owners now facing inverter performance degradation and warranty expiration, they have been motivated to retrofit their PV systems. One such commercial system owner is Mr Aikawa, owner of a 50kW ground mount system.

Mr. Aikawa chose to retrofit his system by installing the SolarEdge single-phase inverter with HD-Wave technology and P600 power optimizers. SolarEdge's DC optimized solution has brought Mr. Aikawa, and his business – Mr. Dream, increased system productivity, reduced maintenance and operation costs, and module-level, real-time site monitoring.

“By replacing our PV inverter with a SolarEdge solution we were able to improve our energy production by more than 10% and generate higher FiT revenue. Using SolarEdge’s monitoring platform we can easily track each module’s performance and better understand the revenue generated from our investment.”
(Mr. Aikawa, system owner)



- Location: Yamanashi Prefecture, Japan
- System owner: Mr. Aikawa from Mr. Dream
- Capacity: 50.88kW
- Installation Date: September 2019
- Inverters: 8 x SE500H-JP
- Power optimizers: 96 x P600
- Modules: Jinko Solar JKM265-J x 192



Maximizing Energy Production with the SolarEdge Retrofit Solution

When Mr. Aikawa's original PV system was installed, a number of modules were located between electricity poles and overhead wires, causing partial module shading. In the subsequent 4 years of system operation, module mismatch continued to increase due to a variety of unplanned obstructions e.g. new tree growth, installation of new electricity cables, and soiling.

Another important factor causing decreased energy production is degradation of the module itself. Even though most modules degrade to an accepted level of 80% of their nameplate output by year 20, this occurs at varying rates, which leads to aging mismatch between modules.

Mr. Aikawa's original system was powered by traditional string inverters, meaning that any module mismatch on a specific string reduced the power output of the entire string of modules, not just of the affected modules.

SolarEdge mitigates energy loss caused by module mismatch

Once SolarEdge inverters replaced Mr. Aikawa's string inverters, he noticed a dramatic >10% increase in energy production. This significant jump was also due to the record-breaking 99% efficiency of SolarEdge's HD-Wave inverters, enabling greater energy production for faster ROI.

This level of inverter efficiency is a huge improvement compared to inverter efficiencies of 94%-95% available in the Japanese solar market 5 years ago.

Module-Level Monitoring for Advanced Asset Management

By upgrading to SolarEdge's 25-year free module-level monitoring platform, Mr. Aikawa's enjoys full visibility into his system's performance. The automatic alerts on system issues, pinpointed on a virtual site map, and the remote troubleshooting and enhanced maintenance capabilities, all combine to reduce his operation and maintenance expenses.

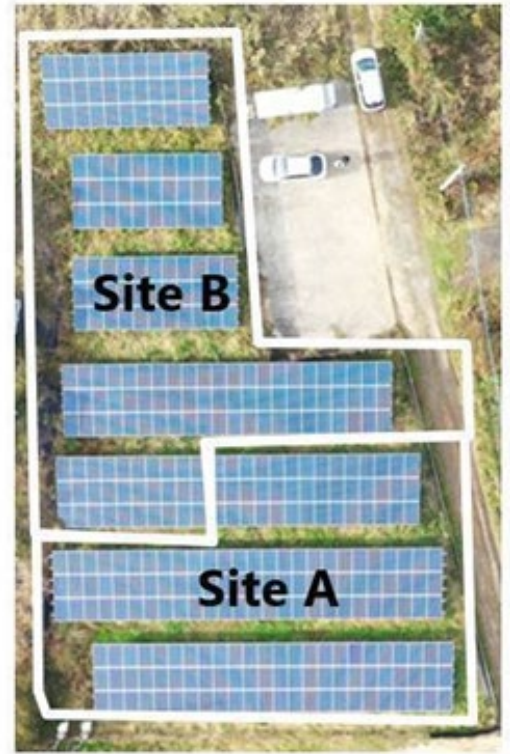
By gaining full insight into the performance of each module in his solar array, Mr. Aikawa can decide to replace any module that is significantly underperforming. If he does replace a module, the new module will then benefit from maximized energy production and will not be affected by mismatch due to module aging.

Design Flexibility Makes Retrofitting Simpler

SolarEdge's flexible design allows for longer strings and strings of uneven lengths. This eases the process of re-stringing the existing system, allowing extra room to maneuver around existing modules.

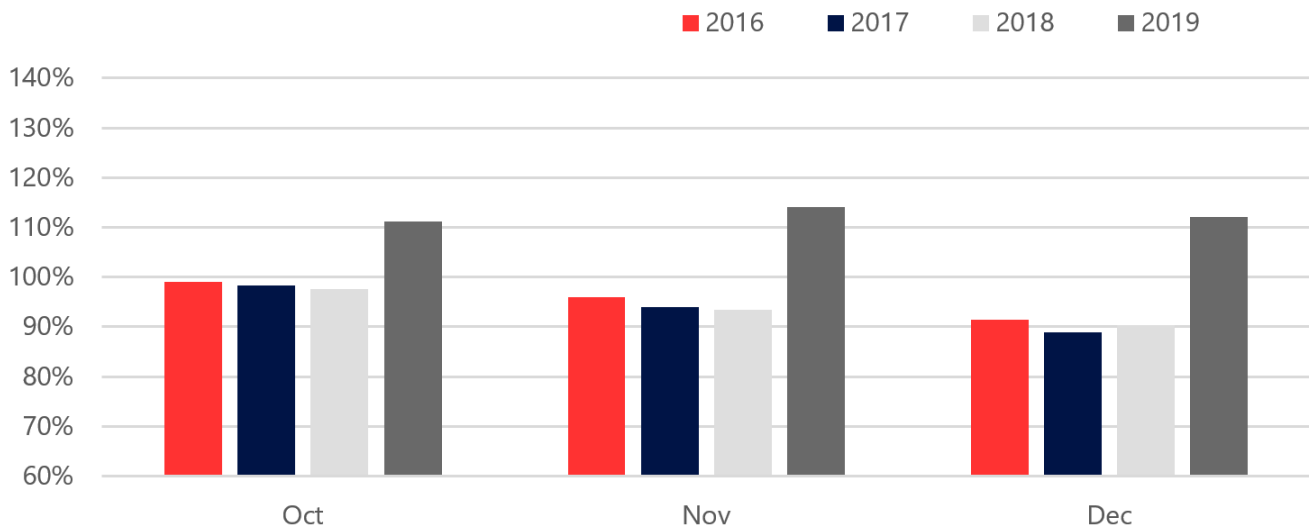
In the original system design, since Mr. Aikawa used a traditional string inverter with 265W modules, 32 strings were required. If he decided to re-power his system with another traditional string inverter, the number of strings would remain unchanged.

As SolarEdge inverters work at a fixed string voltage of 380V, it enables the connection of more modules per string for a fewer number of strings. Therefore, Mr. Aikawa was able to reduce the number of strings from 32 down to only 8. This significantly decreased DC cabling losses, with lower incidence of insulation faults helping to avoid late inverter wake-up (during the morning hours).



Located next to each other, Site A and Site B are both low voltage installations.

Mr. Aikawa chose to first retrofit Site A with SolarEdge while site B currently operates with the original string inverter. The graph below shows a performance comparison of Site A and Site B before and after the retrofit.



This figure shows performance of Site and together with Site B, before (2016-2018) and after (2019) the retrofit of site A. The total production is lower in approximately 10%.