

CASE STUDY

Tigo optimizers increase output by 7% when added to 59 kW system in Japan

Background

Ground mount systems are common in Japan where the energy generated by the array is sold to the power company under a Feed In Tariff. The Feed In Tariff, which is set by the government to incentivize renewable energy production, makes every kilowatt hour produced very valuable.

This 59 kW ground mount solar system was installed in Japan in 2016. The installation includes 10 fixed tilt arrays, as shown in the aerial image below. The site used Astronergy CHSM6610P-260 (260W) modules and 4 Omron KP44M and 5 Omron KP55M inverters.

The challenge

There is a forest to the southeast of the system, and in the morning its shadow casts on the modules, reducing the output of the array. In particular, the shadows of the trees negatively affected energy production with array #8. In order to maximize energy production, the customer looked for ways to minimize the effects of shading on the effected modules that would work with their existing inverters and modules.



An aerial view of the 59 kW ground mount system, with numbers indicating each array.

The solution

In 2020, the owner decided to retrofit the modules in array #8 with Tigo TS4-A-O optimizers in order to mitigate the impact of shade on the array.

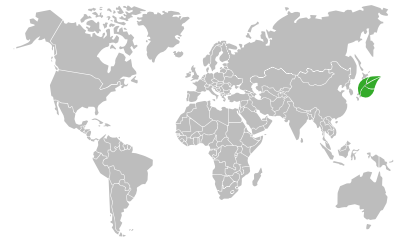
Tigo TS4's could be added to the existing site, and worked with the modules and inverters that were already installed. The Tigo solution enabled a cost-effective and quick way to increase the electricity production at the site.

CUSTOMER TYPE

Commercial ground mount

LOCATION

Saitama, Japan



FEATURES

Optimization
Monitoring
Safety (rapid shutdown)



TIGO EQUIPMENT

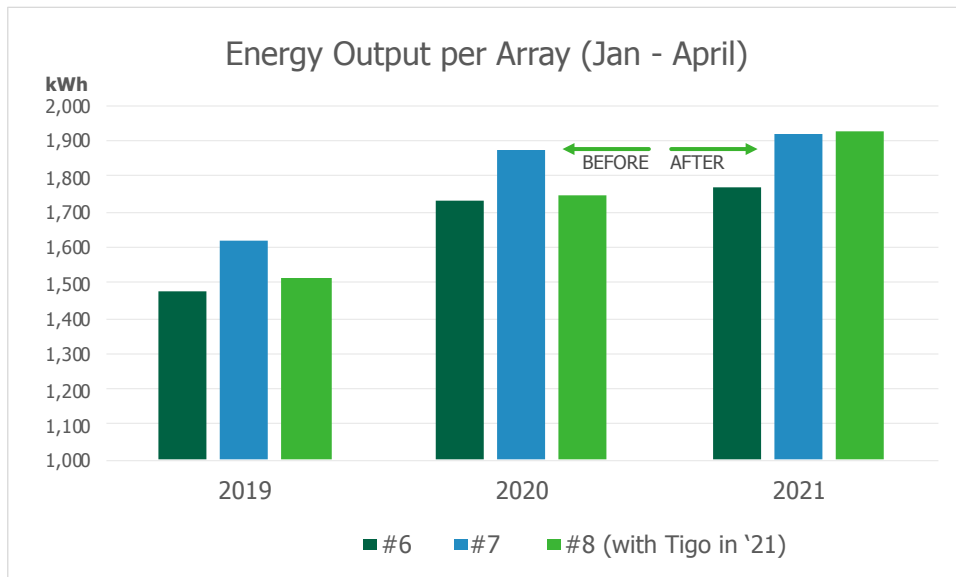
Tigo TS4-A-O
Cloud Connect Advanced
Tigo Access Point

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In the 2 years before the Tigo optimizers were installed, Array #8 (in green) produced 7% less electricity (kWh) than array #7 (in blue). In the year after the optimizers were installed, it produced more than array #7.



Results

Since installing the Tigo optimizers, energy production has increased 7% in array #8 compared to baseline.

In order to validate the increase, the performance of array #8 with Tigo optimizers was compared to the performance of similar arrays. Arrays #6 and #7 both have the same number of PV modules, number of circuits, series wiring, and inverters. Array 6 has some shade whereas Array #7 has very little.

In looking at time series energy (kWh) production data (shown in the graph above), it's clear that array #8 energy output increased significantly relative to the similar arrays. Array #8 went from producing 7% less than Array #7 in 2 consecutive years, to generating more electricity than #7 after Tigo optimizers were installed, despite receiving more

The Tigo Energy Intelligence portal shows the baseline electricity production from each module and the Reclaimed Energy that the .

shade.

With Tigo Energy Intelligence monitoring, the customer was able to see the exact power production of each module where Tigo optimizers were installed. As shown in the image on the left, one can clearly see the modules most effected by shading.

In addition, Tigo Energy Intelligence displays the reclaimed energy enabled by the Optimizers, which varied between 3% in March and April to up to 11% in December. The monthly variation was representative of the severity of the shadows on the array.

Summary

- Increased electricity production: 7%
- Site capacity: 59 kW
- Modules: Astronergy CHSM6610P-260 (260W)
- 4 Omron KP44M and 5 Omron KP55M inverters
- Tigo TS4-A-O optimizers

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