

## Case Study: Tsunagi, Japan

### First Full Mega Solar PV system in Japan

Location: Tsunagi, Japan (熊本県 津奈木町)

System Size: 1.78 MW

#### Summary (日本国内初のメガソーラー事例)

This project in Tsunagi is the first smart Mega Solar array to be commissioned in Japan. The project consists of 6,624 modules installed in 288 strings connected to three central inverters.

#### System Installation and O&M Support

Standard systems only provide inverter or string-level monitoring. This is not enough detail to detect many issues that can occur at the time of commissioning or at any point in the twenty five year lifetime of a solar power plant.

Large systems like these have thousands of modules and even more connections. Many things can, and often do, go wrong when installing systems of this size.

After site commissioning the system also ages, and without panel-level monitoring and analytics it is difficult or impossible to see issues in utility scale solar arrays.

#### Tigo Energy Module-level Monitoring

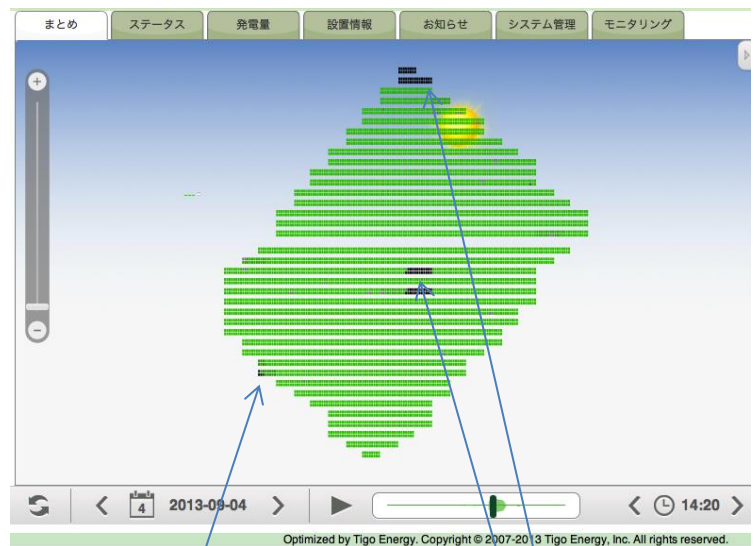
Tigo Energy's module-level monitoring allows installers, systems owners and support personnel to identify system issues the minute they happen.

On every Tigo optimizer there is advanced sensors that can detect voltage, current, and temperature. Tigo's analytic platform then analyzes this data and provides real-time alerting to system owners and O&M providers.

This allows for fast, effective, and lower-cost management of solar assets with stable energy production.



Figure 1: 1.78 MW project in Tsunagi, Japan



Module X10 & X11 are shaded

Open circuit: String ET, EX, HU, & HV



## Result (タイゴの働き)

After commissioning the system Tigo Energy's technology detected several modules showing open circuit or low voltage. Upon further investigation it was discovered that these modules had faulty diodes that had to be replaced.

Tigo's monitoring system also detected four strings that were open-circuits. This was due to a poor connection somewhere in the string. Because Tigo has monitoring on every panel it was simple for the install crew to find the issue and correct it.

The system experiences a lot of shade in the winter time, as shown in Figure 2 and 3. This morning shade lasts until about 10am in the winter. Without the Tigo optimizers on the array it would be producing significantly less (5-10% lower) than a traditional array.

*"I can see what is going on with each solar PV module and caught a couple of the failures in real time. Also, I'm satisfied with the data from Tigo's monitoring system. Substantial amount of shade from the mountains in the winter cause a power production loss which I didn't expect, and without the monitoring I would spend time and money trying to find what is the issue with the system."*

“ストリング監視ではできない個々の太陽光パネルで何が起っているかについて「見える化」でき、現場の不具合をリアルタイムに確認できました。また、冬季に想定していなかった山影によるパワコンの出力低下状況もデータで確認でき満足しています。タイゴのシステムなくしてはこのような問題をすぐには見つけることができなかったでしょう。”

Mr. Eiji Hirose, Director  
Kyushu Asia Partner, Inc.



Figure 2: Installation with minor shade on the south side of the array

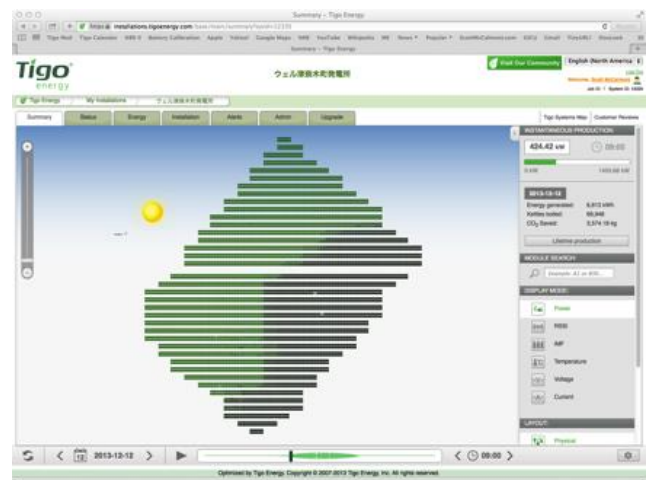


Figure 3: Heavy shading in the winter from nearby trees and power poles

On clear days PCS2 produces less energy due to shade

Cloudy day: same energy from PCS1, PCS2, and PCS3

