

Generate more energy with Tigo

Reclaimed Energy - feature summary



The problem: energy loss from mismatch

All PV systems are affected by some level of mismatch. PV modules are wired in series, and therefore each of the modules affected by mismatch reduces the performance of all other modules on the string and can reduce performance for the entire array. A slight mismatch – let's say only 1% – even on one PV module will be magnified by 20 in a string of 20 panels, reducing the total energy by as much as 19%.

Mismatch can be caused by a variety of factors and affects all PV systems. Commonly, shade from trees or objects causes mismatch, but so does snow, leaves, soiling, natural aging of PV modules as well as small variations from the manufacturing process.



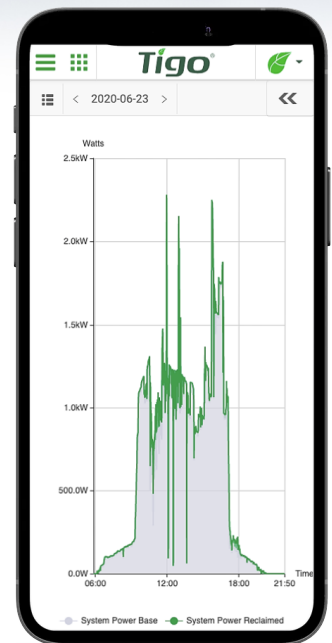
The solution: optimizers

Tigo's TS4 optimizers are designed with patented technology, able to address minor and major impacts of mismatch from shade or other sources, improving the PV system performance. Tigo optimizers constantly measure multiple parameters of the PV modules they're connected to at a high speed and quickly adjust to extract the maximum energy from each PV module. This capability allows each of the modules to add the maximum energy to the string while eliminating the negative impact of the underperforming PV modules on the stronger partners in the string.

Tigo's confidence in its product performance, and the value created, is revealed by showing the energy extracted from each PV module plus the additional energy generated due to the TS4 optimizers in the form of Reclaimed Energy on the Tigo Energy Intelligence monitoring platform.

Validation: Reclaimed Energy

System owners can view the total kilowatt-hours of Reclaimed Energy archived by the Tigo optimizers from within the Tigo Energy Intelligence monitoring portal. Tigo Energy Intelligence shows each 15 minute (Free) or 1-minute (Premium) interval of energy generated as well as Reclaimed Energy so that customers and installers can quantify the payback of the PV system and of the optimizers in isolation. Only Tigo provides Reclaimed Energy data to customers.



Tigo's Reclaimed Energy feature indicates the amount of energy harvested by Tigo optimizers (shown in green for every minute of the day)

Optimization in action

In the residential example shown, the homeowner has 2 strings of 9x 216 W modules and a single-phase inverter. All of the modules have Tigo optimizers installed to minimize the impacts of mismatch created by shade.

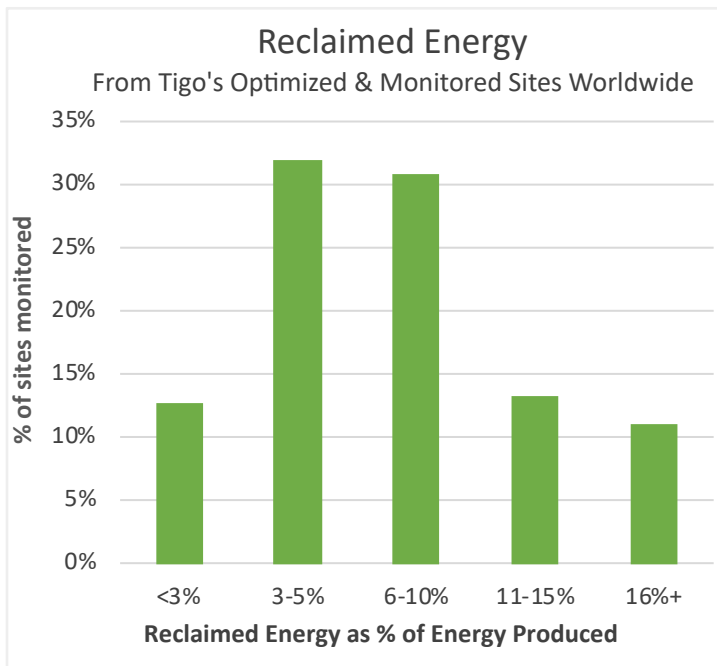
The Tigo Energy Intelligence portal indicates the real-time Reclaimed Energy amount for each module, shown on each module in watts.

String A is being shaded by a tree and utility pole, resulting in lower output. The optimizers are able to reclaim some energy, indicated in Watts on the dark green modules.

Module B5 on String B is being shaded by the chimney, and as a result, Tigo optimizers are optimizing the remaining modules on the string. Reclaimed Energy totals 33-37 W per module, shown on the bright green modules.



Without optimization, the inverter would choose a lower operating point for the string and the unshaded modules would contribute less than what they can produce under the site conditions. Instead, the best performing modules stay at the maximum power point set by the inverter and the optimizers adjust their output for the best result.



Full transparency - available anytime

In a survey of more than 18,000 worldwide sites with Tigo optimizers, over a quarter of the sites improved output by greater than 10% with a median improvement of 6.6%.

Tigo's TS4 optimizers provide the maximum energy harvest and Tigo Energy Intelligence portal enables a unique level of visibility into system energy production. Only Tigo lets customers visualize lifetime system energy production with Reclaimed Energy as a way to quantify the return-on-investment optimization brings to the PV system.

Discover how your installation can benefit from optimization and Reclaimed Energy. Visit our website for more information, downloads, and a monitoring demo: www.tigoenergy.com