



# TrueCapture®

For superior energy yield management

TrueCapture® is an intelligent energy yield management system that increases solar PV plant output by up to **4%** annually. Integrated with our solar tracker hardware systems, TrueCapture is fully validated by independent engineering firms, boosting project performance and financial returns on over 280 projects across 5 continents.

## The need for row-level tracker control

Row-to-row shading, also known as terrain loss, is a common source of lost generation in solar plants. Standard backtracking technology attempts to mitigate this issue by uniformly rotating modules away from the sun at low elevation angles. This solution has limited effectiveness, particularly for sites with sloping or variable terrain and pile height variance – an increasingly common scenario as solar expands to geographies with hilly topography and challenging soil conditions. DNV, Black & Veatch, Leidos, Enertis, ICF and Luminate have modeled annual losses of 2-4% for standard tracking in these cases.

TrueCapture provides a superior solution by leveraging NX Horizon's independent-row architecture and balanced design. TrueCapture addresses shading on a row-by-row basis by correcting the angle of incidence for half-cell modules and permitting the tracker to respond to diffuse light conditions. TrueCapture utilizes sensor arrays and onsite data processing to correct the angle of every row. In contrast, tracking optimization on linked-row systems is constrained to block-level tracking adjustments and limited by slower repositioning time. This difference is especially impactful on sites with undulating terrain.

Combined, TrueCapture and Nextracker's Horizon-XTR™ terrain-following trackers deliver a comprehensive solution for challenging project sites, delivering bankable energy gains perfectly tuned to site topography while dramatically reducing the cost, risk, and environmental impact of grading.



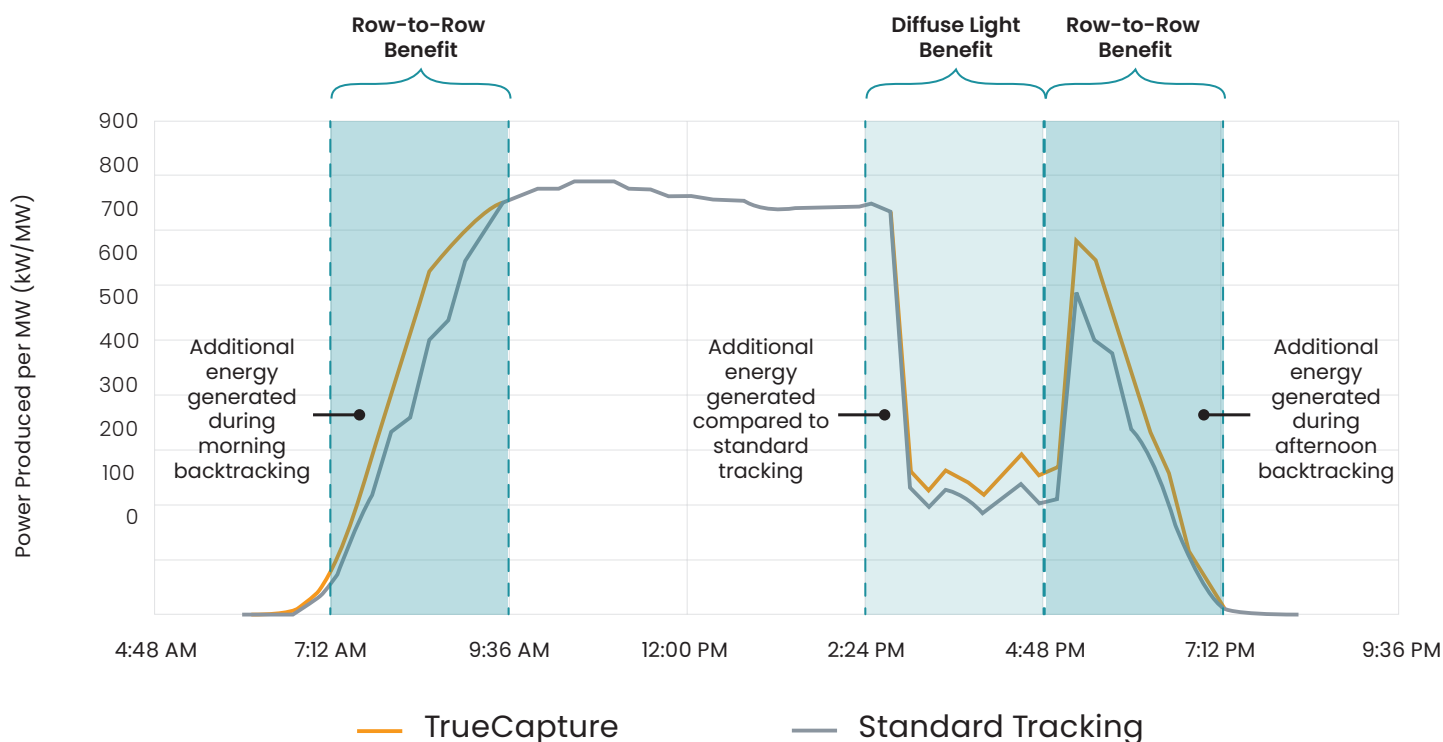
When the engineering report came back, the IE calculated a terrain loss of 2% but gave us a boost of 1.8% because we were using TrueCapture.

– Nick de Vries  
CTO, Silicon Ranch



# TrueCapture vs. Standard Backtracking

Example daily production curve



As shown in the chart, TrueCapture allows the tracker to perform as designed by capturing the "shoulders" of a solar plant's power production curve compared to standard tracking.

## The only tracking energy yield management solution with IE-validated annual gains

One reason Nextracker is the world's most widely deployed and trusted solar tracking provider is our commitment to validating the performance of trackers utilizing TrueCapture through a comprehensive measurement and verification (M&V) program.

This testing is unique among the industry, considers site-specific weather and terrain, and has been verified by independent engineer (IE) and technical advisory firms, including Leidos, DNV, Black & Veatch, Enertis, ICF, and Luminate.

In addition, these IEs have found high accuracy in pre-construction TrueCapture modeling using PVsyst, the most widely used energy prediction tool for developers, investors, and lenders. Measured field performance from our M&V program has been shown to match or exceed Nextracker's pre-construction estimates and IE PVsyst estimates.

IE-validated, in-field performance allows the tracker to perform as designed so that the project delivers expected returns.



## A suite of advanced controls

TrueCapture is designed to give the tracker the freedom to perform as intended across different weather conditions, site topography, and PV module technology. Built by expert teams using Nextracker's unsurpassed data set of historical tracker performance, these models drive as-designed performance for every project throughout the day, whether it's sunny or cloudy, and whether a project uses full-cell, half-cell, or thin-film solar module technology.

**Row-to-Row Tracking:** Under clear-sky conditions, TrueCapture tracks the sun and adjusts the tracker angle for each row based on site topography, the type of module technology used, and their responses to inter-row shading.

- **Full-Cell:** Nextracker's original Shade Avoid control mode works with traditional full-cell modules by calculating angles for each row, which minimizes row-to-row shading as much as possible.
- **Thin-Film:** Thin-film solar modules use true tracking of the sun's position during periods of clear weather, to manage their highly linear response to shading.

**Zonal Diffuse™:** During cloudy, hazy, foggy, and other diffuse-sky conditions, sunlight is scattered across the sky dome, allowing for additional energy to be harvested by adjusting tracker angles to a more horizontal position. By opening the solar module's aperture area to capture more diffuse irradiance, this control mode can prevent the 0.5%-3% annual production losses that would otherwise result from cloudiness or haze at the site.

- TrueCapture includes expanded sensing capabilities and applies different control modes across the solar plant based on real-time light conditions, allowing for granular adjustments on large projects. For example, if the eastern portion of a solar plant is sunny while the western portion is cloudy, TrueCapture will automatically apply zone-specific tracking.





## Key TrueCapture components

TrueCapture delivers industry-leading energy optimization through a combination of hardware, communications, and controls. Nextracker trackers feature independent rows powered by their own solar modules and include a communications and control system that aggregates to the onsite NX Data Hub.

This industrial computer provides advanced plant-level control functions on top of the standard sun position tracking technology onboard each tracker row and meets NERC's CIP-007 cybersecurity standards.

TrueCapture sites feature proprietary smart sensors and pyranometers installed across the project site, providing additional real-time data for the site and every tracker row. TrueCapture uses a project-specific model that accounts for as-built plant geometry, terrain, weather conditions, and module technology.

## Precision controls for complex systems

To perform as intended, each solar power project must optimize for its unique and complex combination of PV technology, site terrain, and variable weather conditions.

TrueCapture makes this possible in combination with Nextracker's unique independent row hardware, communications, and controls. This combination of technologies results in a decentralized command-and-control system that continually calculates and adjusts optimal tracker angles on a row-by-row basis.

TrueCapture ensures that real-world production matches or exceeds pre-construction estimates. By implementing IE-validated TrueCapture, project owners enjoy bankable production projections and lower cost project financing.



Split Boost in operation

TrueCapture production estimates are currently offered by the following independent engineers:

