Reporting from the Field

Test Results Confirm TrueCapture Boosts Real-World Solar Plant Performance by up to 3.5 Percent

NEXTracker's TrueCapture™ smart tracker control technology is a new innovation to increase production yield on solar power plants and allows owners and developers with closed-loop data and communications connectivity to maximize performance and enhance their financial returns over the lifetime of the plant. TrueCapture dynamically adjusts the angular position of each independent tracker row in response to site topography, weather conditions, and geospatial location of the arrays.

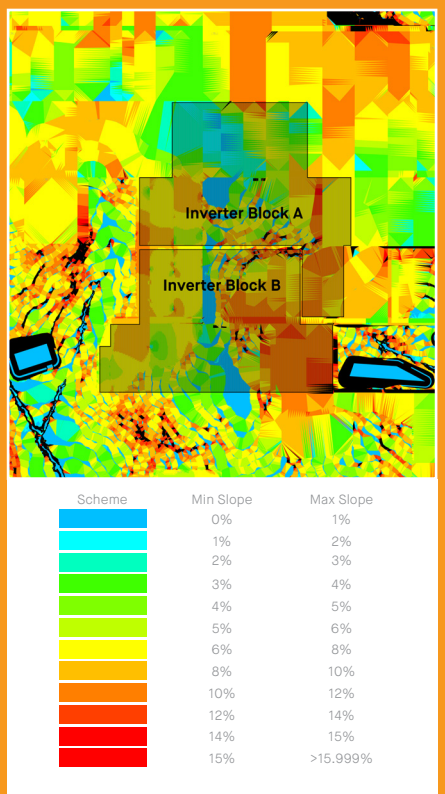
Plant owners with TrueCapture enabled on their project sites can use the NX Data Hub to verify in real-time that the technology is in action by comparing actual tracker angles against planned angles. The machine-learning software technology has been validated by top independent engineering firms and project production uplift is being financed by debt and tax equity lenders.

TrueCapture also provides benefits for engineering, procurement and construction (EPC) firms working on sites with significant terrain undulation. Initial data analysis demonstrates that EPCs can potentially save millions of dollars in civil groundwork costs on challenging terrain. The smart tracker control system captures the lost energy caused by shading on extremely undulating sites, allowing EPCs to focus on the constructability of the plant and avoid costly and environmentally aggressive cut-and-fill site-leveling activities.

TrueCapture has been implemented by a growing number of leading developers on gigawatts of existing and planned sites worldwide.

Project Overview

Location	**Southeast U.S.**
No. of NX Horizon rows	**4,075**
Modules	**338,662**
Inverters	**36**



Topography map with tracker layout for Southeast U.S. project site.

TrueCapture Benefit

1.8% annual gain for test block with row-to-row application only

3.5% annual gain for test block with both row-to-row and diffuse application

35 Year Revenue Benefit

$3.8M over 35 years with **1.8% GAIN**

$9.6M over 35 years with **3.5% GAIN**

Site Description and Problem Statement

Since its introduction to the solar industry, TrueCapture has been running in test mode on multiple utility sites to precisely determine the software's real-world performance benefits. NEXTracker has collected more than a year's worth of data to confirm optimized energy production projections. One such test site is located in the Southeast United States. Completed in 2018, this plant has specific site challenges with terrain undulation and diffuse light conditions that can reduce production.

Test Methodology

The field trial test used at this site focused on TrueCapture's performance on two 2.2 MW inverter blocks, one measuring both row-to-row (R2R) and diffuse performance in a part of the plant with rolling terrain (6.1% average slope), the other measuring R2R-only located in a section with a less rolling topography (4.5% average slope). Each test block was set in day-on, day-off mode for TrueCapture controls—not only because of the unique undulation variations in each block but also due to the unique constructed pier heights of each tracker row.

Test Results

The energy production for days with and without TrueCapture running were measured beginning in April 2018 and collected for more than a year and normalized for temperature and irradiance for accurate comparisons. Based on the comparative tests during the 15-month trial period, the R2R-only block showed an average annual gain of 1.8%, while the block using both TrueCapture's R2R and diffuse yielded a cumulative production benefit of 3.5% per year.

The two TrueCapture controls are complementary: while R2R shade avoidance showed higher energy production in the morning and late afternoon, the diffuse application demonstrated high production gains during cloudy days. In the winter months when the sun is low in the sky and there is more overcast weather, the site showed higher contribution from diffuse control while the summer months showed dominant R2R gains.

Temperature-Corrected Inverter Performance with and without TrueCapture