surya | CUSTOMER CASE STUDY

MODULE INSPECTION WITH DIGITAL TRACEABILITY

How Ecotec inspected more than 320,000 solar modules and created a complete digital record of quality issues, linked to individual module barcodes, in just 15 days.

320,628	15 DAYS	~8,000	4
modules inspected	field scanning period	issues identified	crew members

The project

At a 180 MW fixed-tilt solar farm in Germany, Ecotec needed to inspect more than 320,000 photovoltaic modules, flag and categorise the type of module cracks found, and scan and record the barcode of each flagged module along with its exact digital location. The completed dataset needed to support a clear handover to the asset manager for future operations and maintenance activities which included:

- Categorising issues found into 5 colour coded groups
- Overlay issue category colours on the module layout showing which module had which issue
- Tag the scanned barcode digitally to each affected module

About Ecotec

Ecotec Deutschland GmbH is a German solar installation company specialising in the engineering, construction and commissioning of photovoltaic projects. Since 2009, Ecotec has delivered more than 300 projects representing over 3 GW of capacity. Ecotec has used Surya over the past two years for digital twin, construction progress and materials tracking. This project was the first use of the platform for module-level quality control.

The challenge

- Create an accurate digital representation of the site, linking every affected module, barcode and quality issue.
- Enable field teams to quickly navigate the array, interact with digital modules and record information accurately in the field.
- Capture standardised quality classifications and photographic evidence offline, with synchronisation once network coverage becomes available.
- Perform an exceptionally high-volume scanning exercise efficiently while minimising repetitive handling and manual administration.
- Deliver a clear, intuitive and detailed close-out record to support issue rectification, commissioning and long-term asset management.

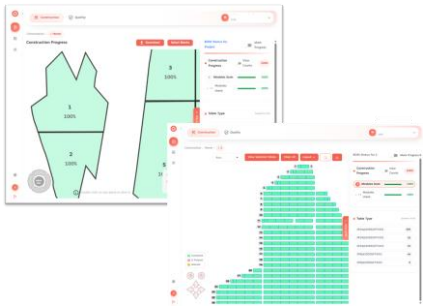
The Surya workflow

1 BUILD	2 SCAN	3 INSPECT	4 CLOSE OUT
Import the CAD layout and create a geolocated digital twin.	Use an offline-capable tablet to capture each module barcode.	Classify issues and attach field photographs where required.	Visualise progress and issue locations for rectification and handover.

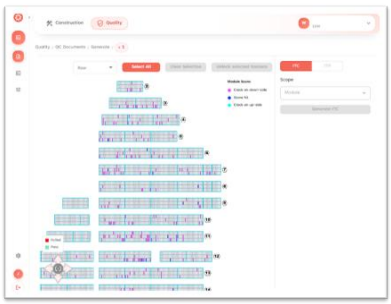
A field-ready digital solution

Surya's digital twin was configured directly from the site CAD layout, linking every module to its precise location within the array. The platform provided real-time visibility of completed and outstanding inspections, enabling both field and remote teams to accurately monitor progress. Using Surya's offline-capable tablet application, crews were able to simultaneously scan module barcodes, record punch-list items, categorise defects and capture photographic evidence, with all data synchronised once network connectivity was restored.

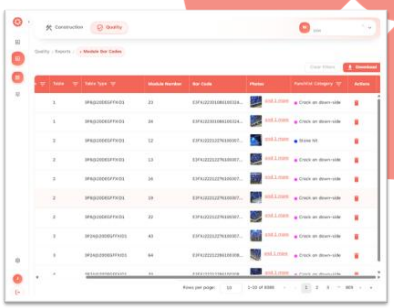
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Scanning progress across the site



Geolocated, colour-coded quality issues



Module records with barcodes and photographs

Results and value

Ecotec estimated the Surya solution reduced labour costs by approximately 50% compared with alternative module scanning technologies and its previous spreadsheet-based punch-list process. These savings were driven by faster inspection tracking, accurate barcode capture, integrated defect classification and photographic evidence collection, eliminating the need for separate data consolidation, CAD updates and manual data clean-up activities.

Rapid, high-volume capture

320,628 modules were inspected over a fifteen-day inspection period with just a 4-member crew.

Actionable quality visibility

Approximately 8,000 issues were surfaced for review, with categories including glass impacts and cracks on different module surfaces.

Faster issue location

The digital site view made it easier to identify where affected modules were located and support targeted close-out activities.

Stronger handover record

Barcode, location, issue category and photographic evidence were brought together in a structured digital record for commissioning and ongoing O&M use.

> “We went from planning it, to implementing it, to fully executing it — and at every step, Surya adapted to what we actually needed on site. That's the Surya we know today: a tool we can consistently rely on to solve our on-site challenges. - Ecotec”

What comes next

Ecotec is exploring how the same approach could help accelerate the close-out of foundation and structural issues identified during solar construction. The module-level record could also provide long-term value to the asset owner by preserving visibility of quality hotspots at commissioning and supporting targeted inspection and maintenance over the operating life of the plant.

See how Surya creates one digital record from construction through commissioning on our website.