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Aerial thermography for analyzing solar asset health

13 June 2024

7:00 am – 8:00 am | PDT, Los Angeles
10:00 am – 11:00 am | EDT, New York City
4:00 pm - 5:00 pm | CEST, Berlin

Ryan Kennedy
Editor
pv magazine USA

Deanna Amodeo
Analysis Operations Lead
Zeitview

Kevin Monsour
Business Development Manager
Zeitview

Welcome!

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Do you have any questions? ❓ 🙋

Send them in via the Q&A tab. 👉 We aim to answer as many as we can today!

You can also let us know of any tech problems there.

We are recording this webinar today. 📹

We‘ll let you know by email where to find it and the slide deck, so you can re-watch it at your convenience. 👀 💡

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Exploring the Future of Solar Diagnostics:

Thermography & IV Curve Tracing

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Exploring the Future of Solar Diagnostics:

Thermography & IV Curve Tracing

Zeitview Overview

We uniquely offer our customers a one-stop, global solution for their multiple assets (wind, solar, property, electric utility and telecom) throughout their lifecycle.

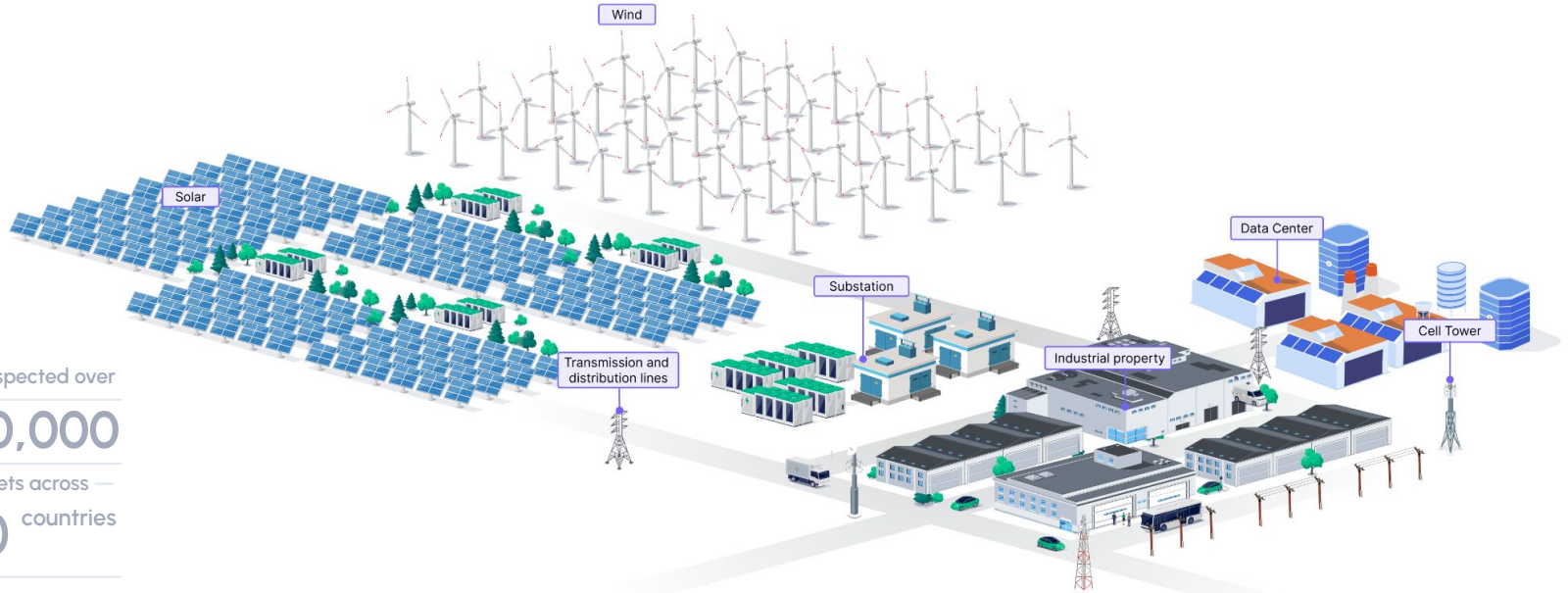
1 Pre-Construction
Optimize bids, site selection, and construction planning

2 Construction
Track progress of work compared to planning

3 Commissioning
Verify construction and set performance baselines

4 Operation & Maintenance
Verify construction and set performance baselines

5 Sell/ Acquire
Verify performance and overall state of site



We inspected over

100,000

assets across

80 countries

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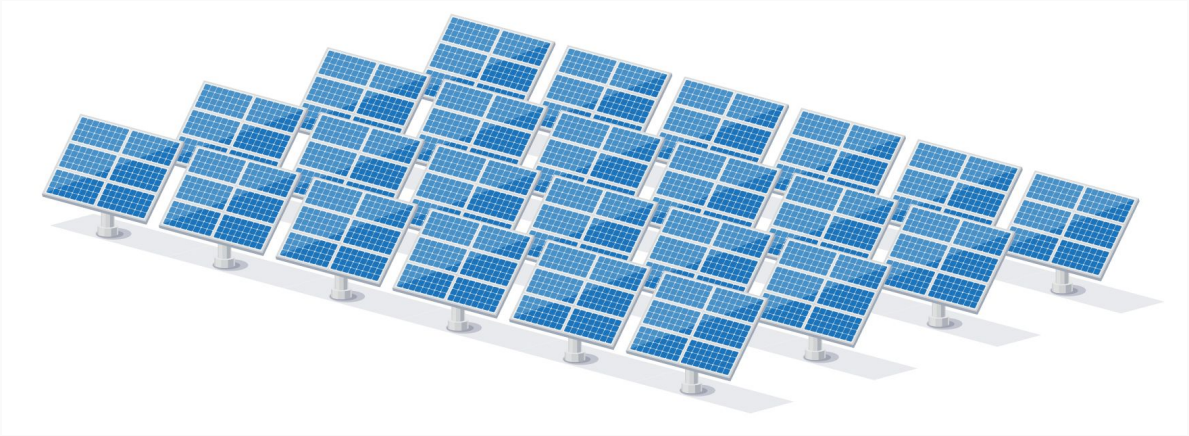
Solar Energy

Utility and Commercial Solar Inspections



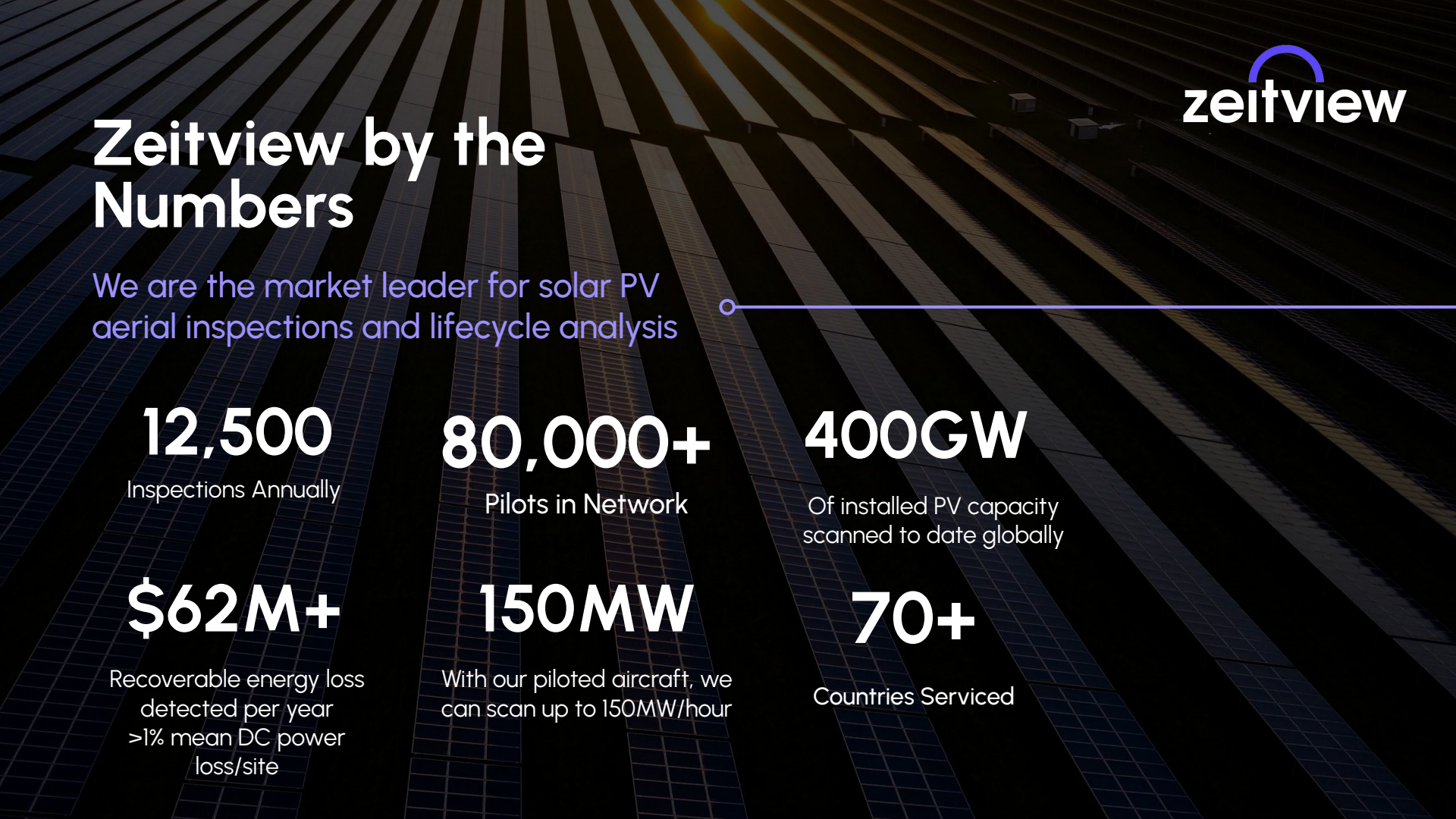
Pre-Construction
Optimize bids, site selection, and construction planning

Construction
Track progress of work compared to planning

Commissioning
Verify construction and set performance baselines

Operation & Maintenance
Reduce performance degradation on site issues

Sell/ Acquire
Verify performance and overall state of site



Zeitview by the Numbers

We are the market leader for solar PV aerial inspections and lifecycle analysis

12,500
Inspections Annually

80,000+
Pilots in Network

400GW
Of installed PV capacity scanned to date globally

$62M+
Recoverable energy loss detected per year >1% mean DC power loss/site

150MW
With our piloted aircraft, we can scan up to 150MW/hour

70+
Countries Serviced

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The State of U.S. Solar

179GW

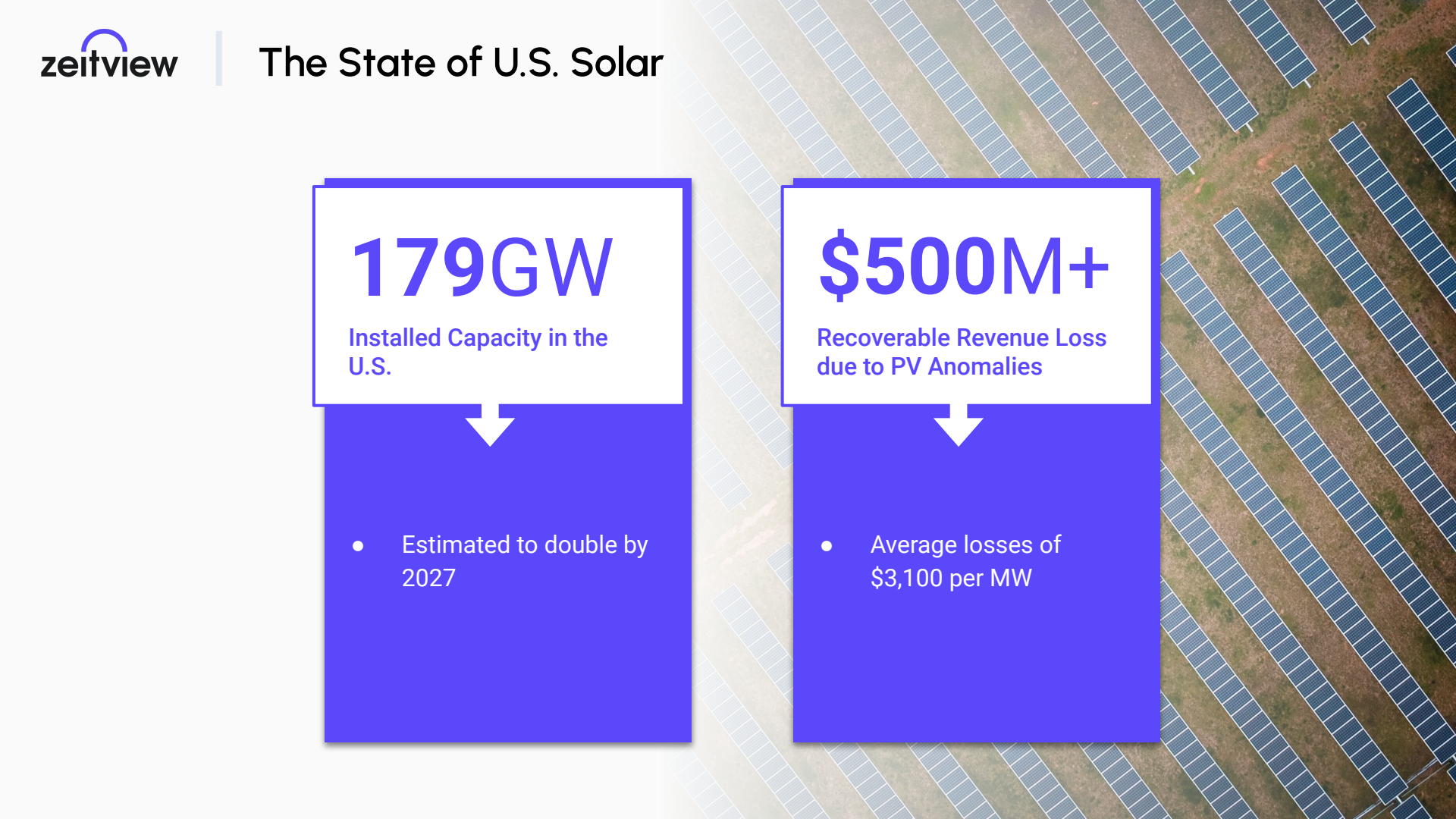
Installed Capacity in the U.S.

- Estimated to double by 2027

$500M+

Recoverable Revenue Loss due to PV Anomalies

- Average losses of $3,100 per MW

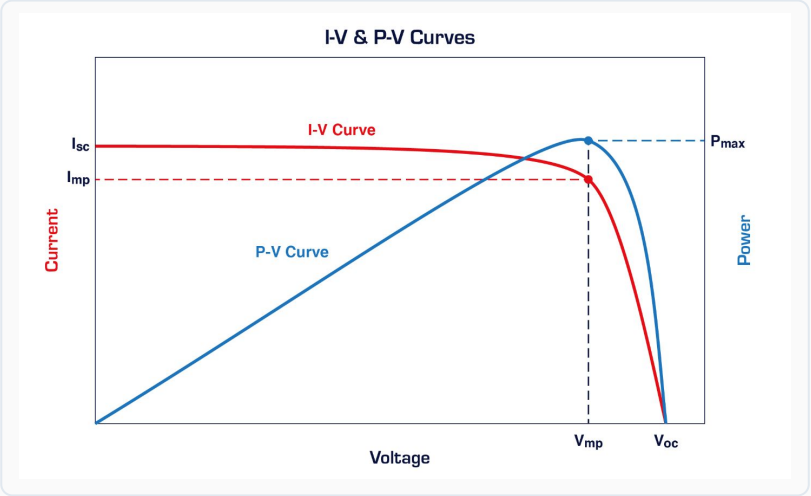


Traditional Methods of Diagnostics

IV Curve Trace: Overview

IV Curve Tracing

Measures the current (I) compared to the Voltage (V) Evaluate the performance and DC of solar PV modules and arrays.



String Level IV Curve Trace: Complexities

- **Time Consuming**
  Detail oriented and manual & Operational Interruptions
- **Limited situational awareness**
  Root cause Identification & Locating module fault
- **Conditional**
  Environmental dependance
- **Complexity and Skilled labor**
  Technical expertise & Equipment and calibration
- **Hazardous**
  Exposure to high voltage electrical circuitry

Photo: PV Magazine

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String Level IV Curve Trace: Advantages

- **Benchmarking and Comparison**
  Performance benchmarking & Historical comparison
- **Fault Identification**
  Open Circuits, Short Circuits
- **Standardized Testing**
  Industry standard process for PV diagnostics

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Thermography: Overview

Thermography
involves capturing infrared images to identify temperature variations that indicate potential issues within solar panels and arrays.

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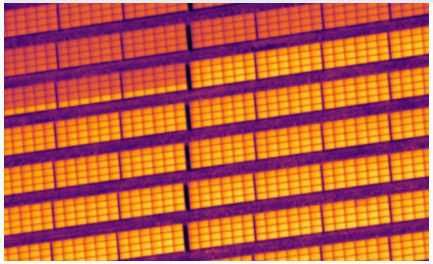
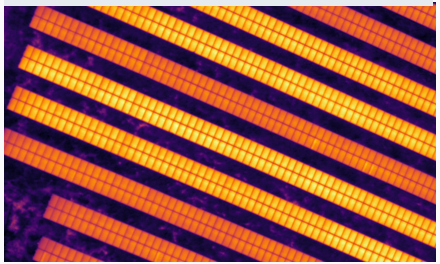
Thermal Anomaly Examples

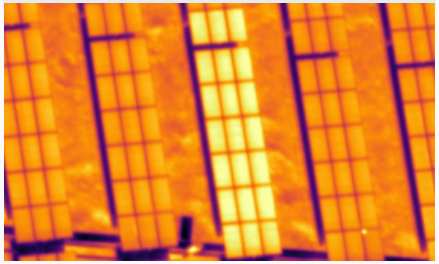
Inverter Outage



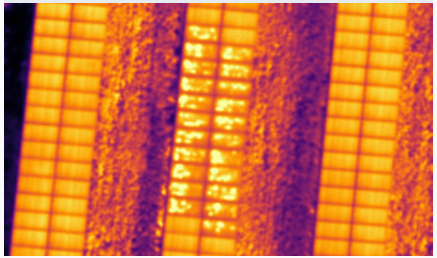
Combiner Outage



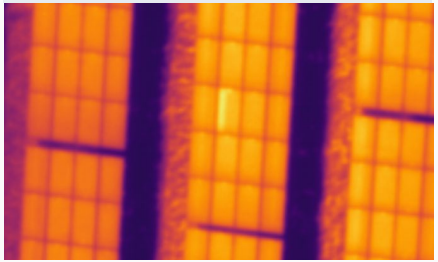
String Outage



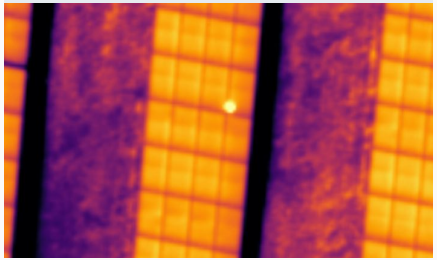
Short Circuit



Sub-module Anomaly



Hot Spot



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Thermography: Complexities

Environmental Dependence

Weather sensitivity & Time of day

Logistics

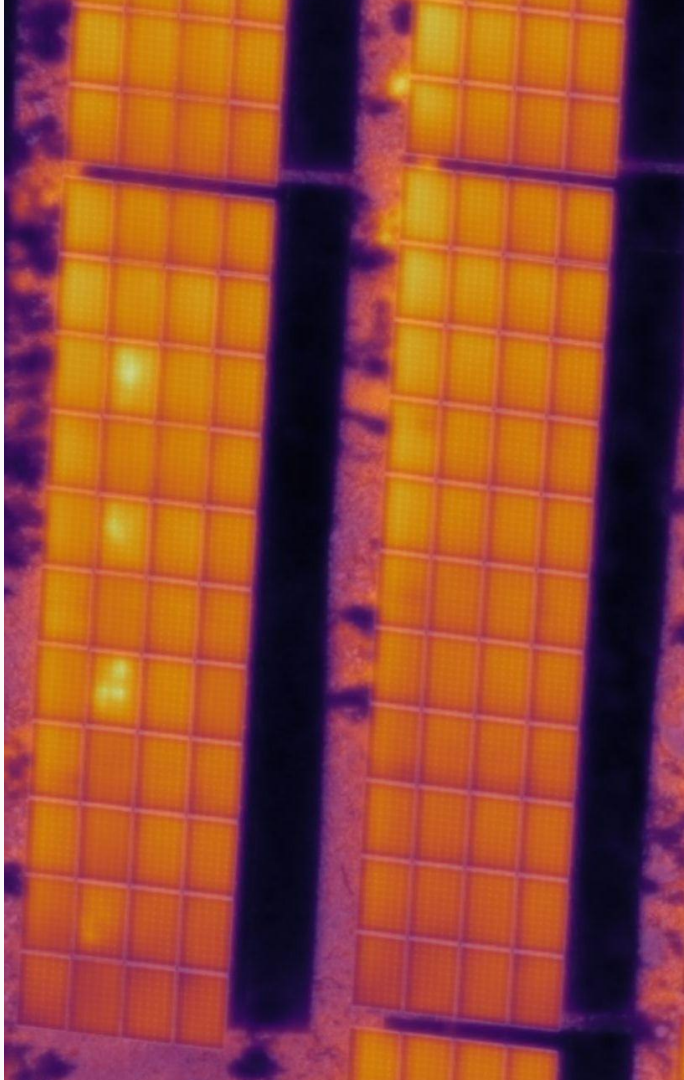
Regulatory, Airspace & Coordination

Interpretation Challenges

Complex Analysis & Technical Expertise

Cost & Accessibility

Equipment & Operational Costs



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Thermography: Advantages

Non-invasive and Non-Destructive

No interruption & preserves integrity

Rapid and Efficient Data collection

Large area coverage in a short amount of time

Highly Sensitive

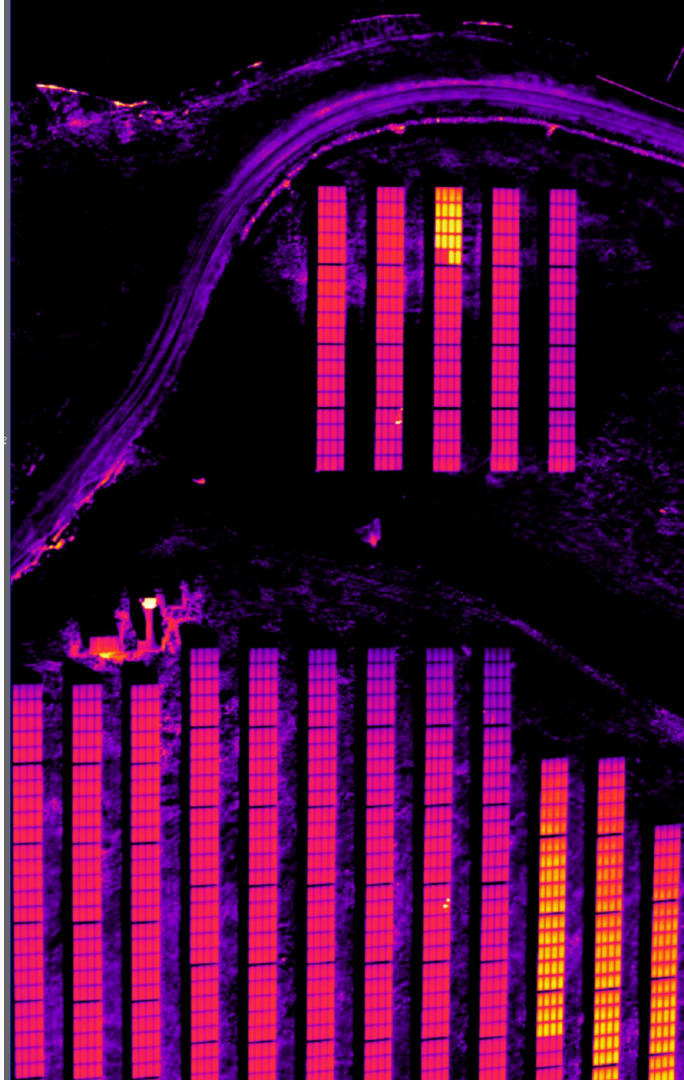
Hotspot identification & cell level anomalies

Comprehensive Situational Awareness

Detailed mapping & Exact location pinpointing

Enhanced Safety

Minimizes exposure to risk & enables remote inspections



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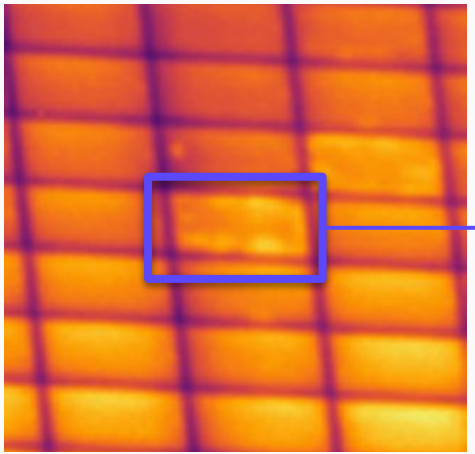
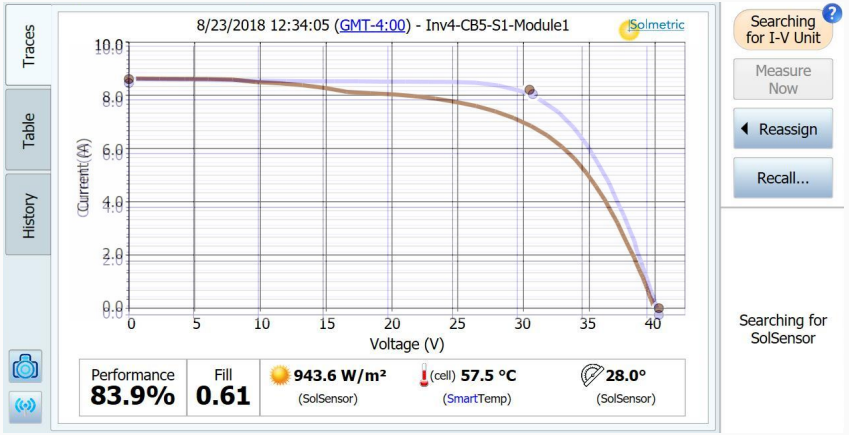
Anomaly Type: Low Efficiency Edge Cells





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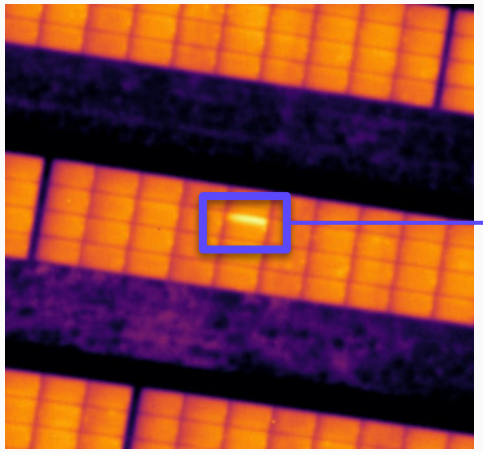
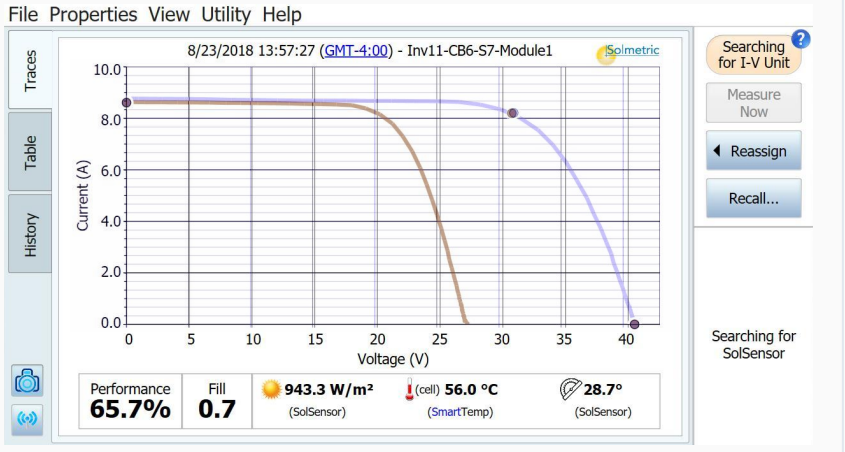
Anomaly Type: Sub Module Anomaly





Comparison

	Voc (Polarity) Check	I-V Trace	Zeitview Aerial Inspection	Targeted Module I-V
String Polarity	✔	✔	✔	
String Length	✔	✔	✔	
String level bulk degradation		±10%	–	
Module level bulk degradation				✔
Module Failures		Some	✔	
Hot Spots			✔	
Micro-cracks (causing hot-spots)			✔	
Spatial distribution of faults			✔	
Warrantable module faults			✔	

Examples // Thermography Demo

Conclusion

The Move to Thermal

Identify with thermal, validate with IV Curve and Remediate with reduced risk and improved visibility.

Thermal

Thermal imagery provides a map of asset anomalies, helping to easily prioritize, navigate and plan O&M.

IV

Secondary verification of DC loss using IV curve is fantastic to quantifying the impact of a solar anomaly.

Remediation

With all the information O&M can reduce risk, improve speed and ensure high quality remediation every time.

Get in touch

Kevin Monsour

kevin.monsour@zeitview.com
416.580.4501

We'll also be at

Intersolar EU 19-21 June
RE+ - 9-12 September

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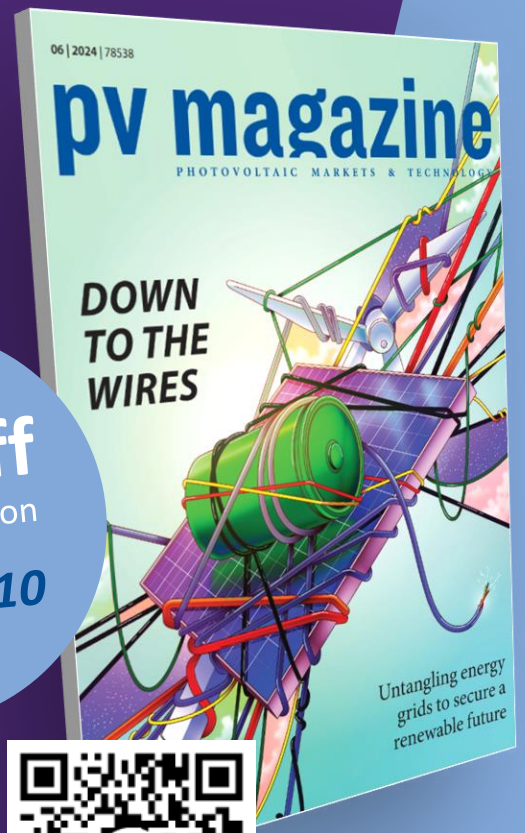

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