



# Live Smarter

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VP Technology Development

# Vivint, Inc.

- Largest home automation services provider in North America
- Founded in 1999
- More than 7,000 employees
- Currently services 800,000 home security customers
- In-house sales, installation, monitoring and customer service teams
- Listed #46 on Forbes' 2013 *America's Most Promising Companies*



- Founded in 2011
- More than 1600 full-time employees
- Within 2 years, grew to become second largest residential solar provider in the United States
- Installs in 7 states
- More than 24,000 customers
- Direct, in-person sales strategy that provides consultative customer contact and high closing ratio





## Solmetric

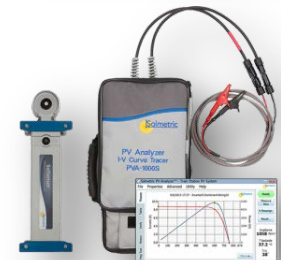
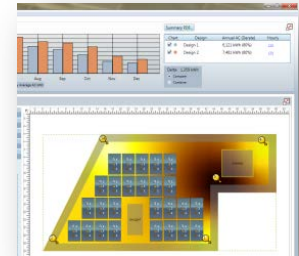
- Acquired by Vivint Solar in 2014
- Founded in 2005
- About 20 employees
- \$3M revenue



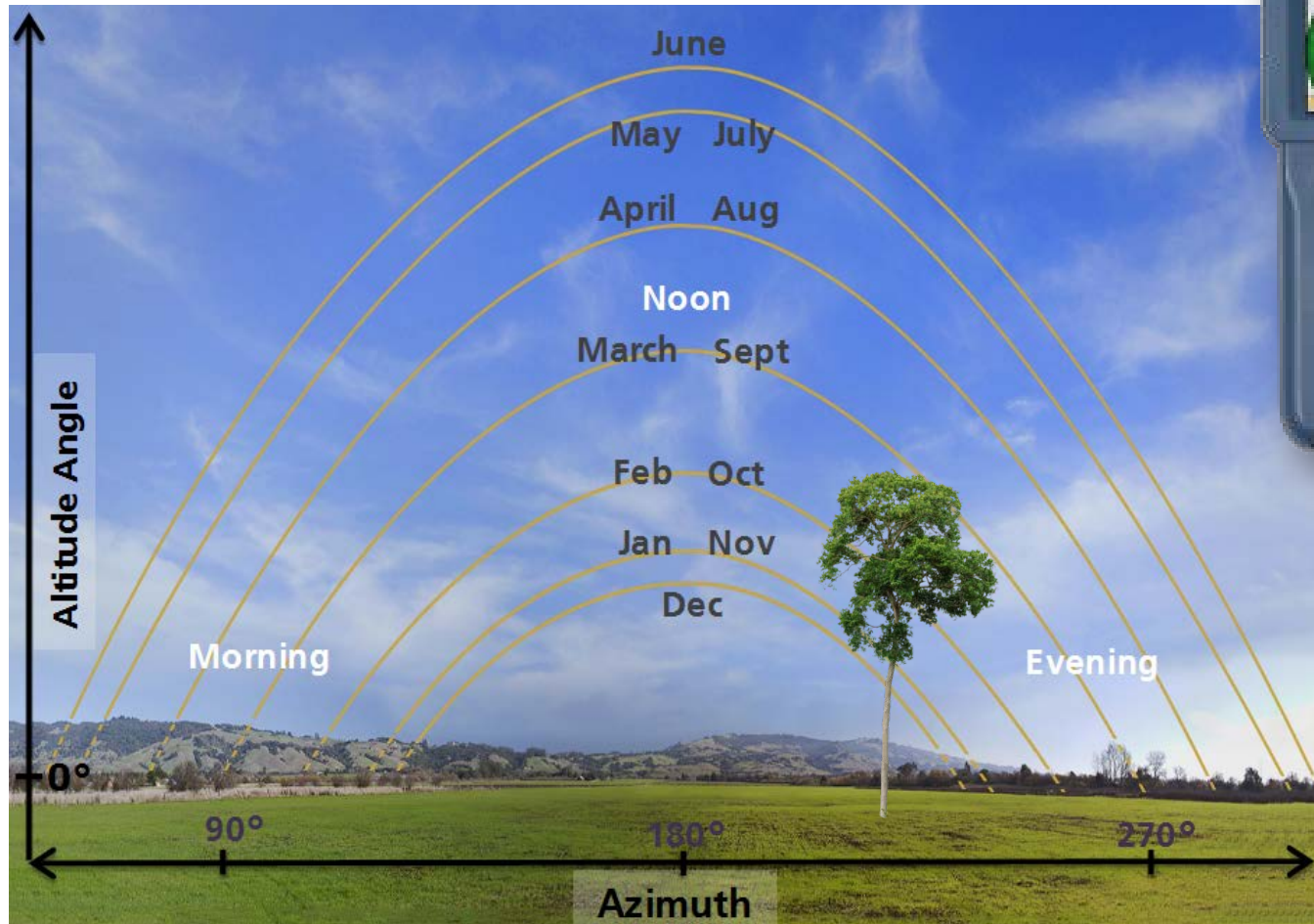


Expert tools that  
measure and maximize  
*Return On Irradiance*

- World leader in shade measurements
- Most sophisticated residential PV design software for integrating on-site shade measurements
- Leading I-V curve tracer in US
- Experts in PV performance measurements and analytics
- 8 patents
- Worldwide sales channel

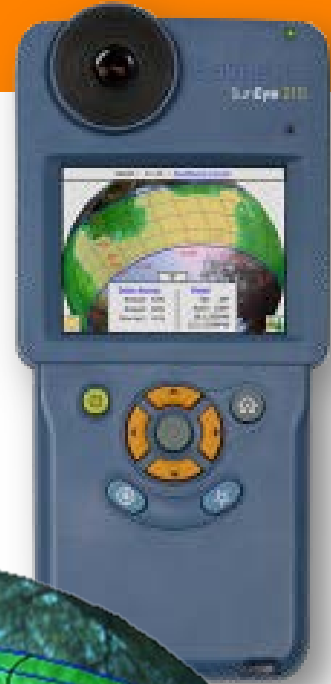


## Measuring Shade



## The Solmetric SunEye – How it measures shade

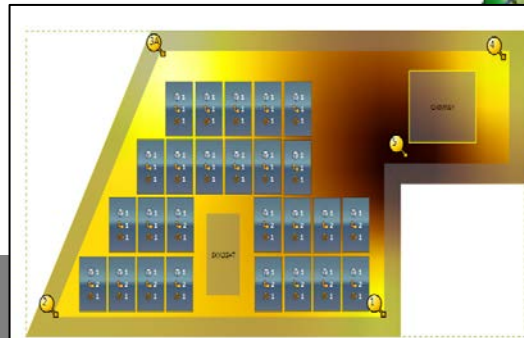
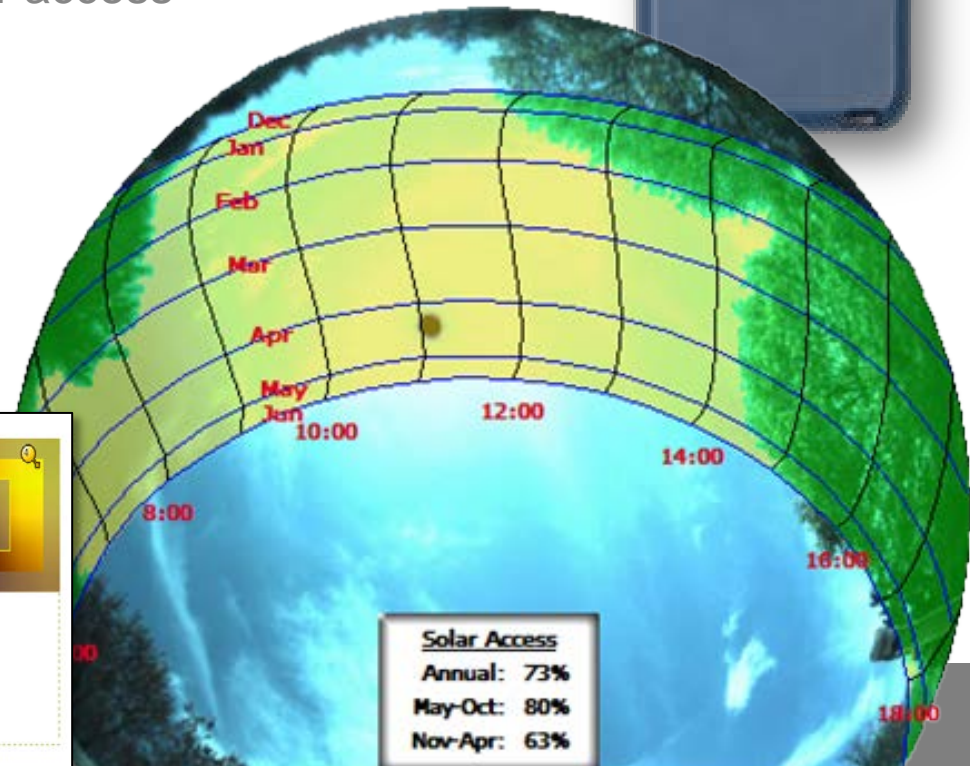
- Calibrated fisheye camera captures image of the sky and horizon
- GPS, compass, and tilt sensors capture location and orientation
- Superimposes sunpaths on top of image
- Detects open sky and calculates solar access



*Solar Access* =

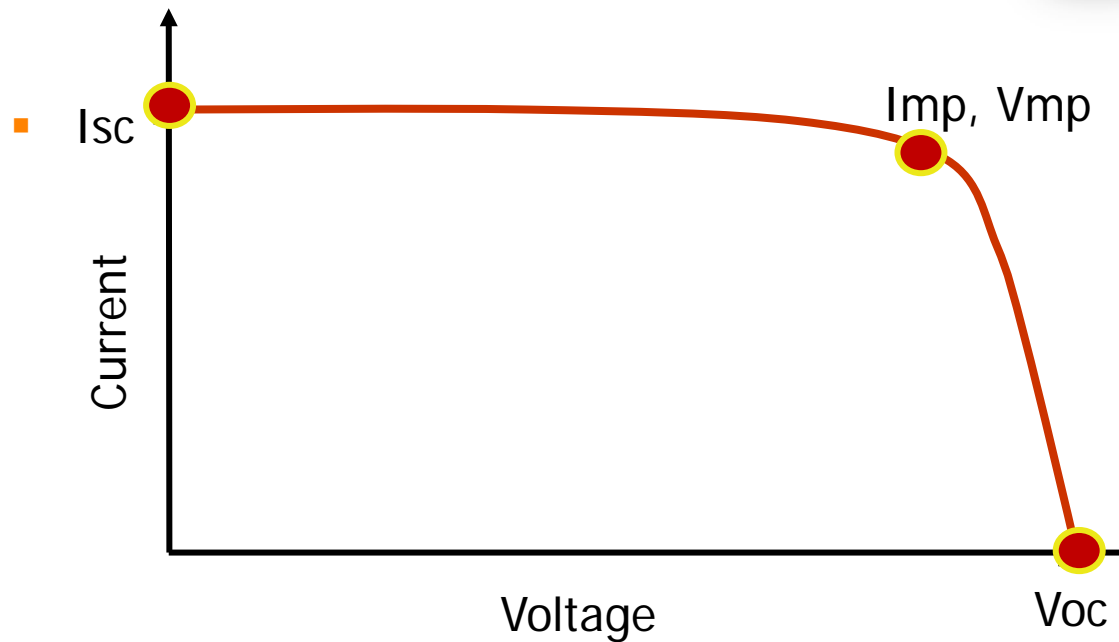
Available insolation with shading

Available insolation with no shading



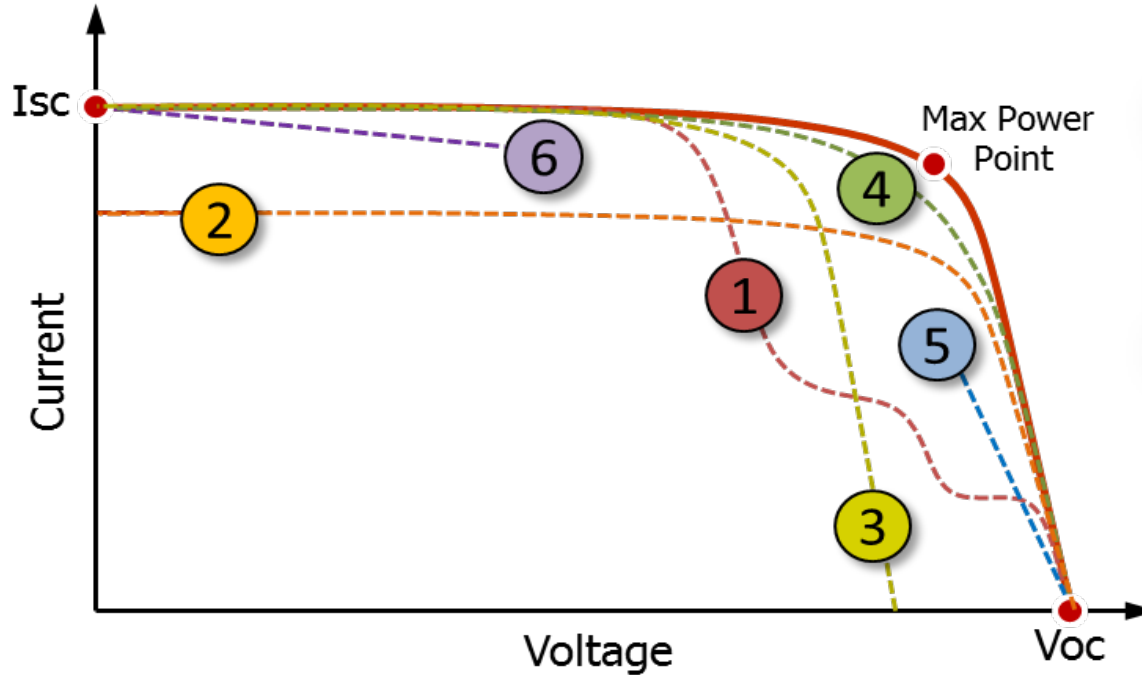
## Measuring PV performance with the Solmetric PV Analyzer

- Measure I-V curve of every string at commission time
- Simultaneously measure irradiance and temperature
- Most reliable assessment of PV performance

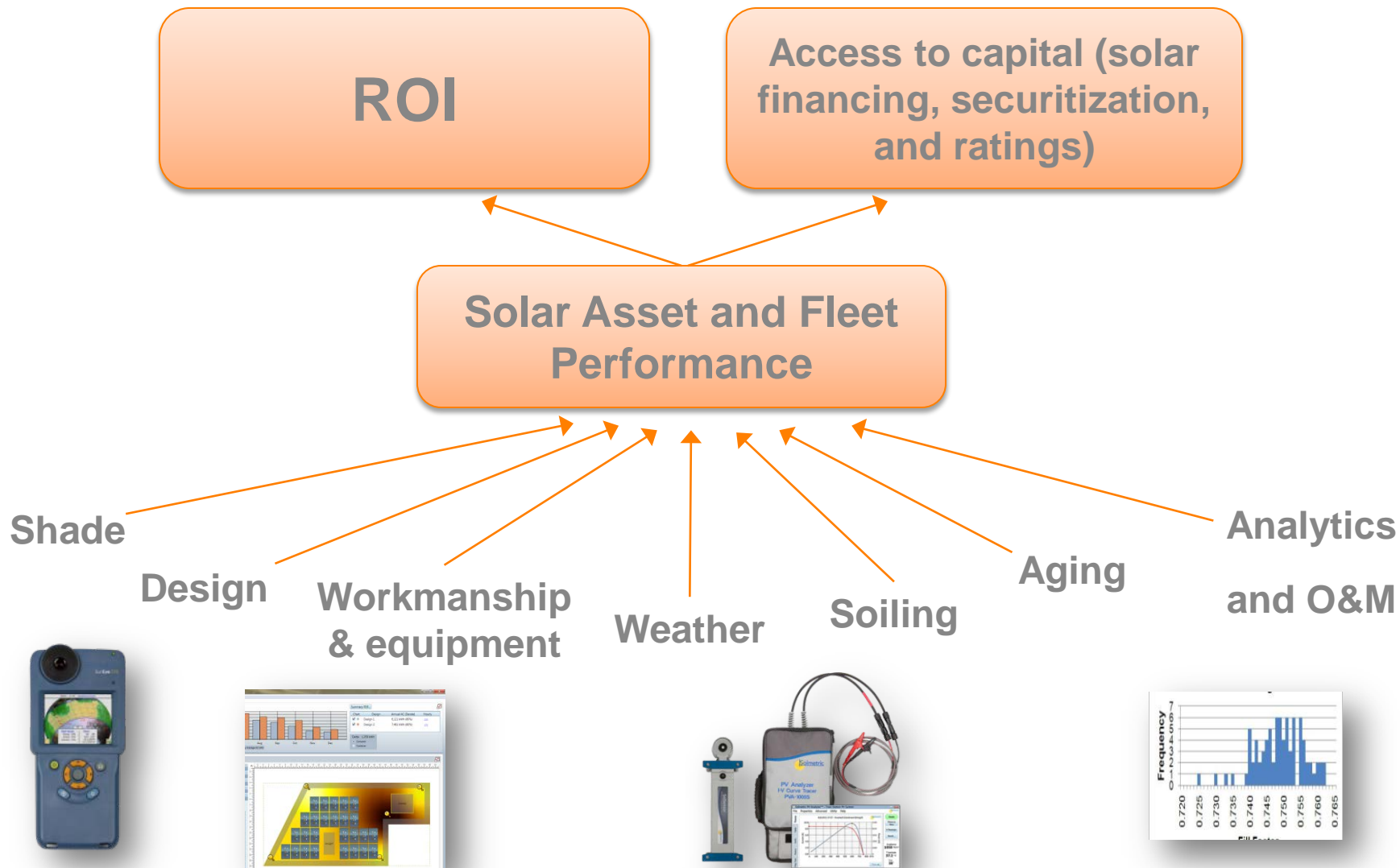




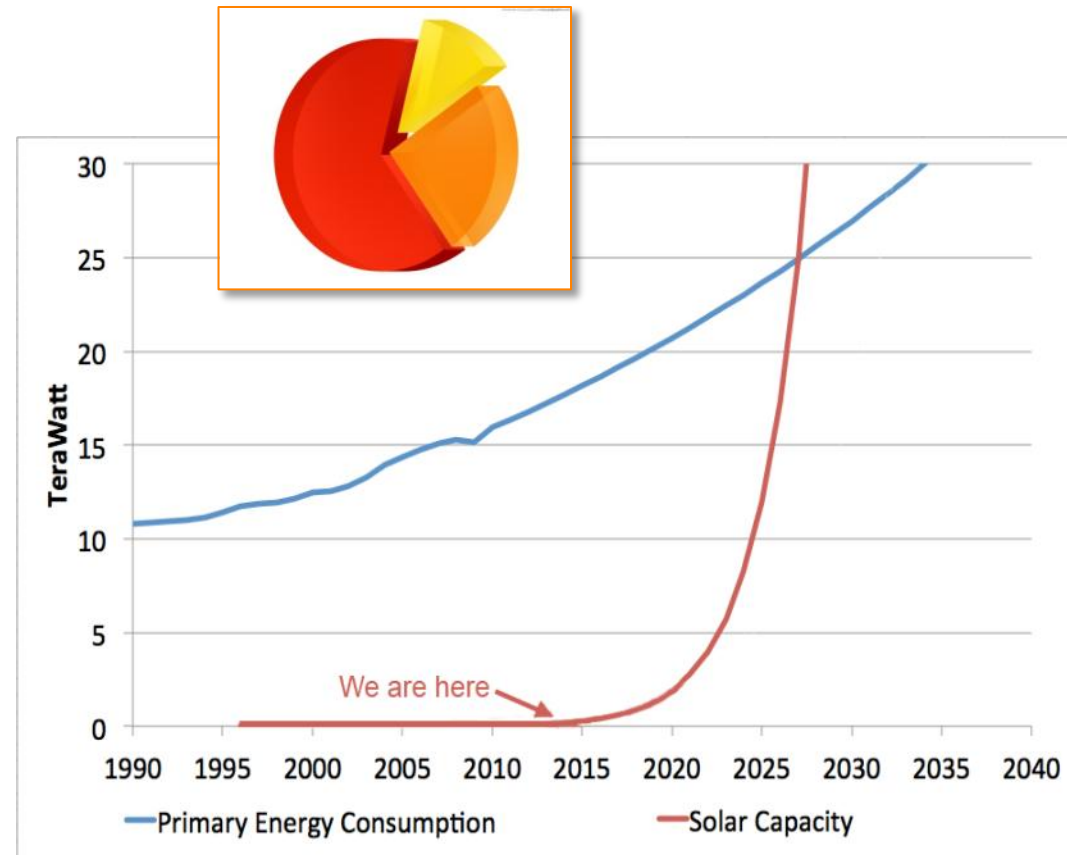
## Failure modes detected in I-V curve



- 1 Notches--partial shading, cracked cells, shorted bypass diode
- 2 Low current--aging or soiling
- 3 Low voltage--shorted bypass diode
- 4 Soft knee--aging
- 5 Decreased slope of vertical leg--excess series resistance
- 6 Increased slope of horizontal leg--excess shunt resistance



- Compete for pie slices, collaborate and assist to grow the pie
- Solmetric's products are important for overall industry growth
- Solmetric will continue to supply industry with existing products, enhancements, and new products



From "1/2 Way Point to a 100% Solar Energy Future" by Stefan Broadley, SolarFinancing.com

**vivint.** solar<sup>TM</sup>