

The top half of the slide features a dark horizontal band. On the left side of this band is the Sunpower logo, with the word "SUNPOWER" in white, uppercase letters and a trademark symbol. The letter "O" is stylized with a glowing effect. To the right of the logo is a grid of dark, hexagonal shapes representing solar panels. A solid yellow vertical bar is on the far right edge of the dark band.

SUNPOWER™

Real-time Monitoring a Large Fleet of Solar PV Powerplants

Steve Hanawalt, Vice President, O&M

April 26, 2010

Agenda

- SunPower Overview
- SunPower O&M Overview
- Why Real-time Monitoring
- Why PI
- How we are Using PI
- Technical Roadmap
- Q&A

SunPower

- Worldwide footprint
- 5,100 Employees: All we do is solar
- Over a quarter century of experience
- Over 550 systems on 4 continents
- Over 500 MW installed
- Largest solar projects in North America
- World record solar cell efficiency = MORE POWER
- Over 85 patents and over 20 years of R&D
- Publicly traded (NASDAQ) and partnerships with top-tier financiers
- Energy efficiency expertise

Established and Proven. Technology Leaders.



SunPower can build
1 MW per day, from
factory to field



SunPower O&M Overview

More than 100 years of utility plant operating experience

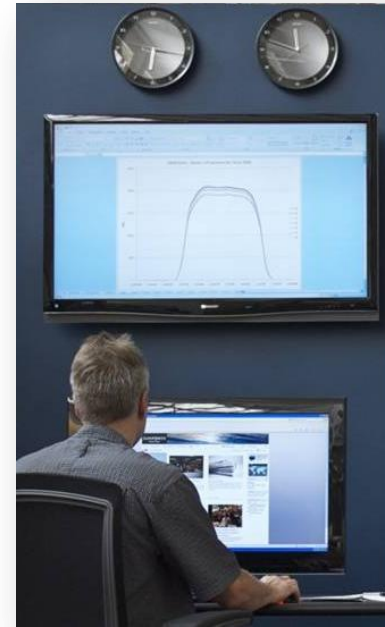
Utility-class enterprise asset management (IBM Maximo) and real-time monitoring (OSI PI) systems platforms

“We exist to deliver high levels of customer satisfaction by optimizing the operational and economic performance of our customers’ solar power systems”

SunPower operates more utility-scale PV power plants than any else in the world

Regional service centers provide rapid response to unplanned outages

SunPower O&M Overview



- > 500 MW monitored
- > 550 systems monitored
- > 95 power plants >1MW
- > 10 years of O&M experience
- Guaranteed performance
- 24/7/365 real-time plant monitoring
- Customer visibility of system performance via web portal
- Regional service centers

SunPower Utility Power Plant O&M Experience



Nellis AFB, Las Vegas, NV
14 MW SunPower T0/T20 Tracker



Bavaria Solar I&II, Germany,
10 MW SunPower T0 Tracker



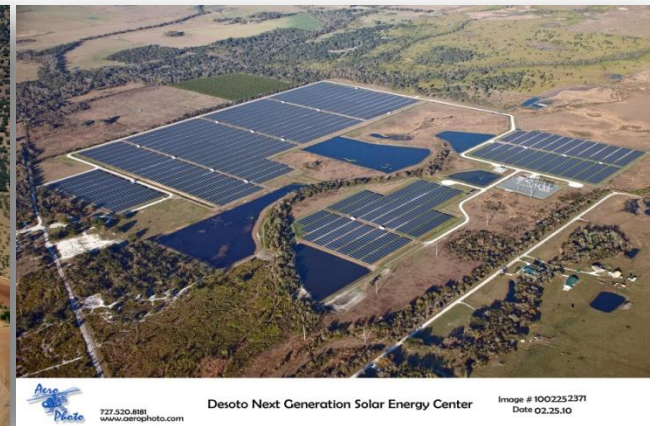
Tinajeros, Spain
12 MW SunPower T0 Tracker



Olivenza, Spain
18 MW SunPower T0/T20 Tracker



Serpa, Portugal
11 MW SunPower T0 Tracker

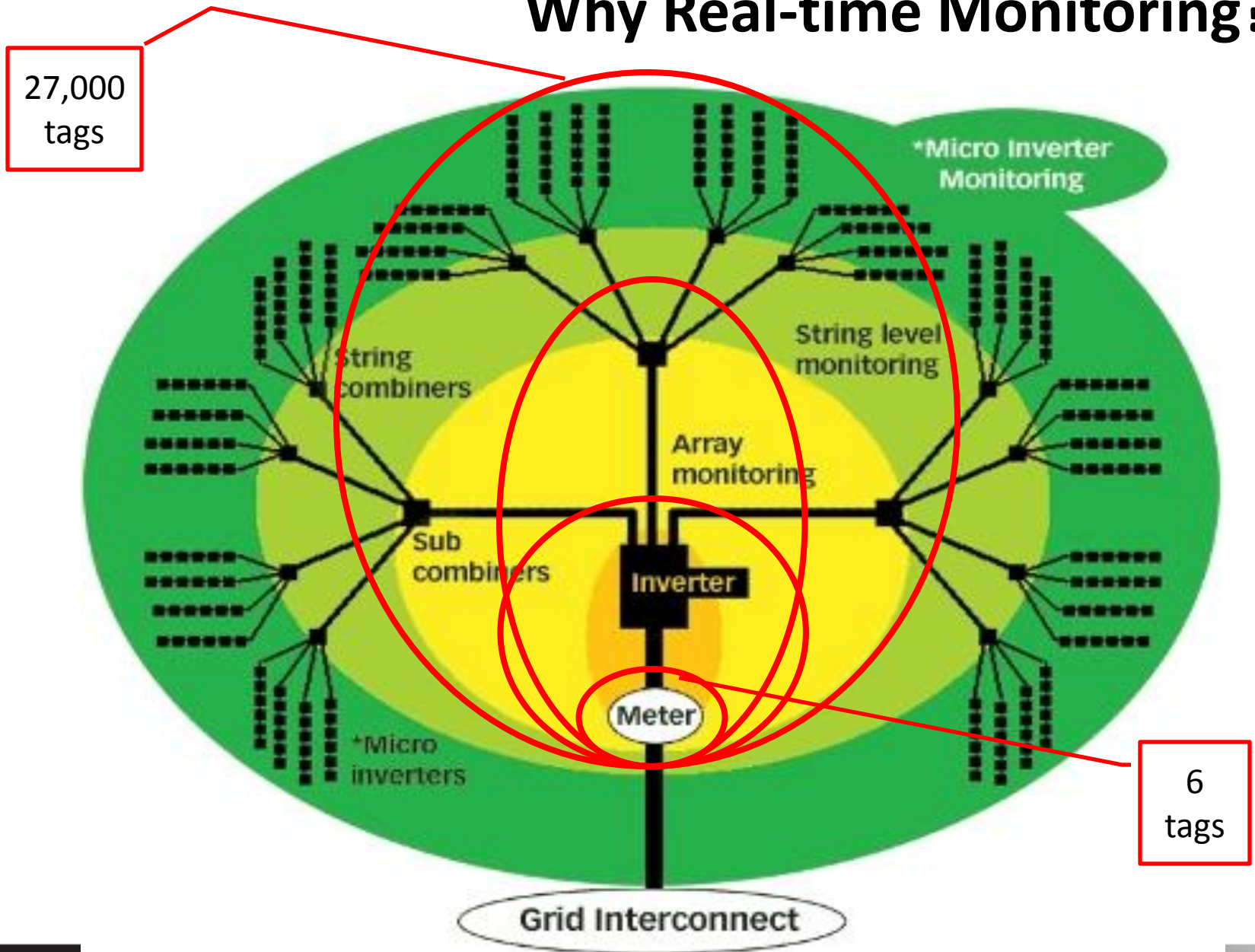


FPL Desoto, Florida,
25 MW SunPower T0 Tracker

Why Real-time Monitoring?

- Solar PV Power – same & different
 - Traditional Power: large fuel / small labor
 - Solar Power: small fuel / large labor
 - Traditional Power: high complexity / few generators
 - Solar Power: low complexity / many generators
- Point?
 - To compete, we need to effectively manage and optimize the large labor/many generators cost structure

Why Real-time Monitoring?



Why Real-time Monitoring?

- Key to our Strategy of...
 - Driving labor costs down
 - Managing performance of our many generators

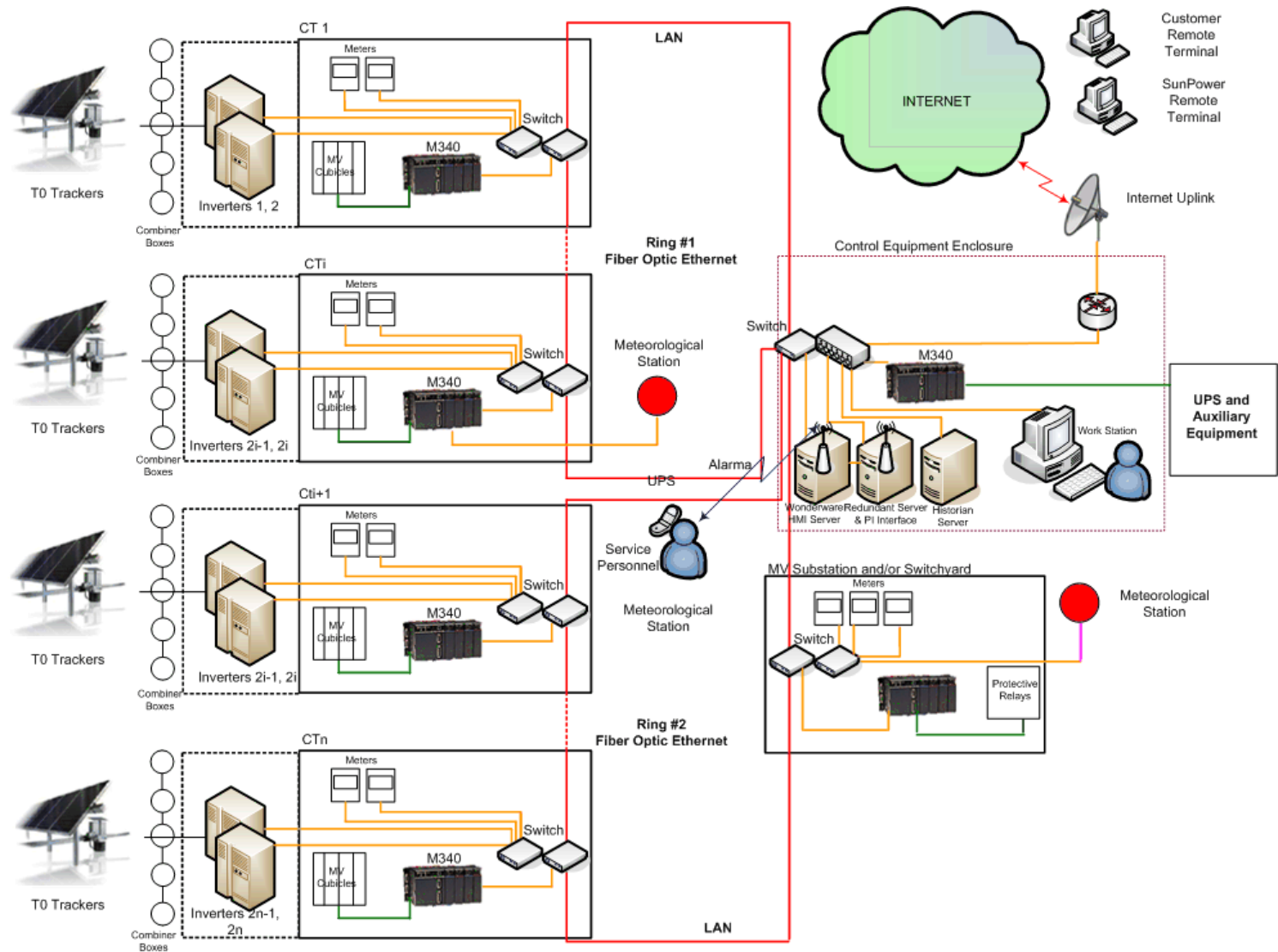


Why PI?

- Proven
- Robust
- Scalable
- Event Detection & Notification (AF technology)



How we are Using PI

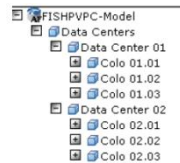


How we are Using PI

- SunPower O&M Monitoring
 - Solar Alarm Management System (SAMS)
 - Performance engineer deep-dive
- Customer Visibility
 - Web portal
 - Direct PI-to-PI API



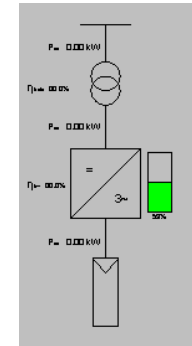
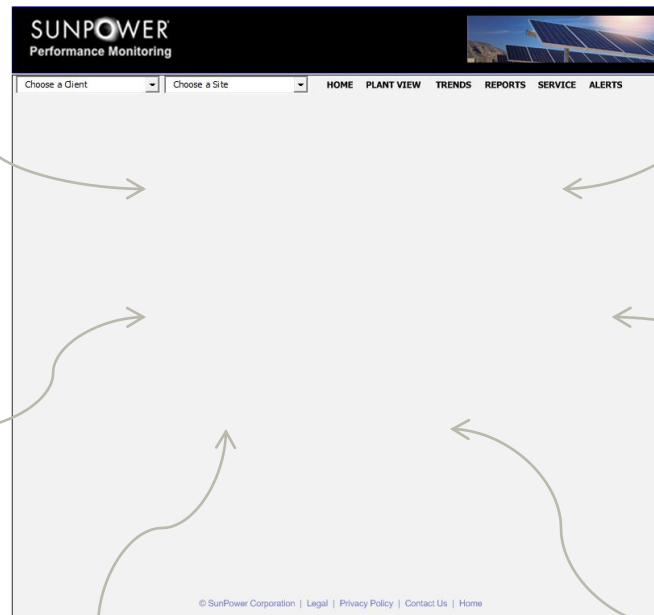
PI content conversion for SharePoint



PI tree view web part



Integrated maps



PI graphic web part

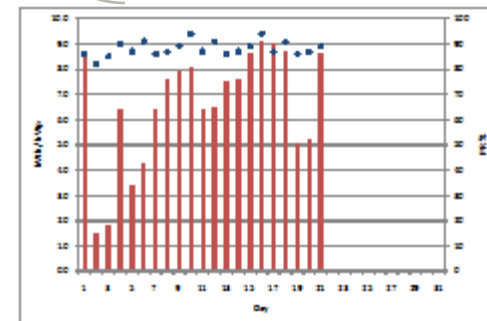
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INV04-A	INV04-B	INV04-C	INV04-D	INV05-A	INV05-B	INV05-C	INV05-D	INV06-A	INV06-B	INV06-C	INV06-D
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INV07-A	INV07-B	INV07-C	INV07-D	INV08-A	INV08-B	INV08-C	INV08-D	INV09-A	INV09-B	INV09-C	INV09-D
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INV10-A	INV10-B	INV10-C	INV10-D	INV11-A	INV11-B	INV11-C	INV11-D	INV12-A	INV12-B	INV12-C	INV12-D
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INV22-A	INV22-B	INV22-C	INV22-D	INV23-A	INV23-B	INV23-C	INV23-D	INV24-A	INV24-B	INV24-C	INV24-D
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INV25-A	INV25-B	INV25-C	INV25-D	INV26-A	INV26-B	INV26-C	INV26-D	INV27-A	INV27-B	INV27-C	INV27-D
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INV31-A	INV31-B	INV31-C	INV31-D	INV32-A	INV32-B	INV32-C	INV32-D	INV33-A	INV33-B	INV33-C	INV33-D
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INV34-A	INV34-B	INV34-C	INV34-D	INV35-A	INV35-B	INV35-C	INV35-D	INV36-A	INV36-B	INV36-C	INV36-D
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INV37-A	INV37-B	INV37-C	INV37-D	INV38-A	INV38-B	INV38-C	INV38-D	INV39-A	INV39-B	INV39-C	INV39-D
75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%	75%
INV40-A	INV40-B	INV40-C	INV40-D	INV41-A	INV41-B	INV41-C	INV41-D	INV42-A	INV42-B	INV42-C	INV42-D
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PI data link for excel services

Operations Scorecard

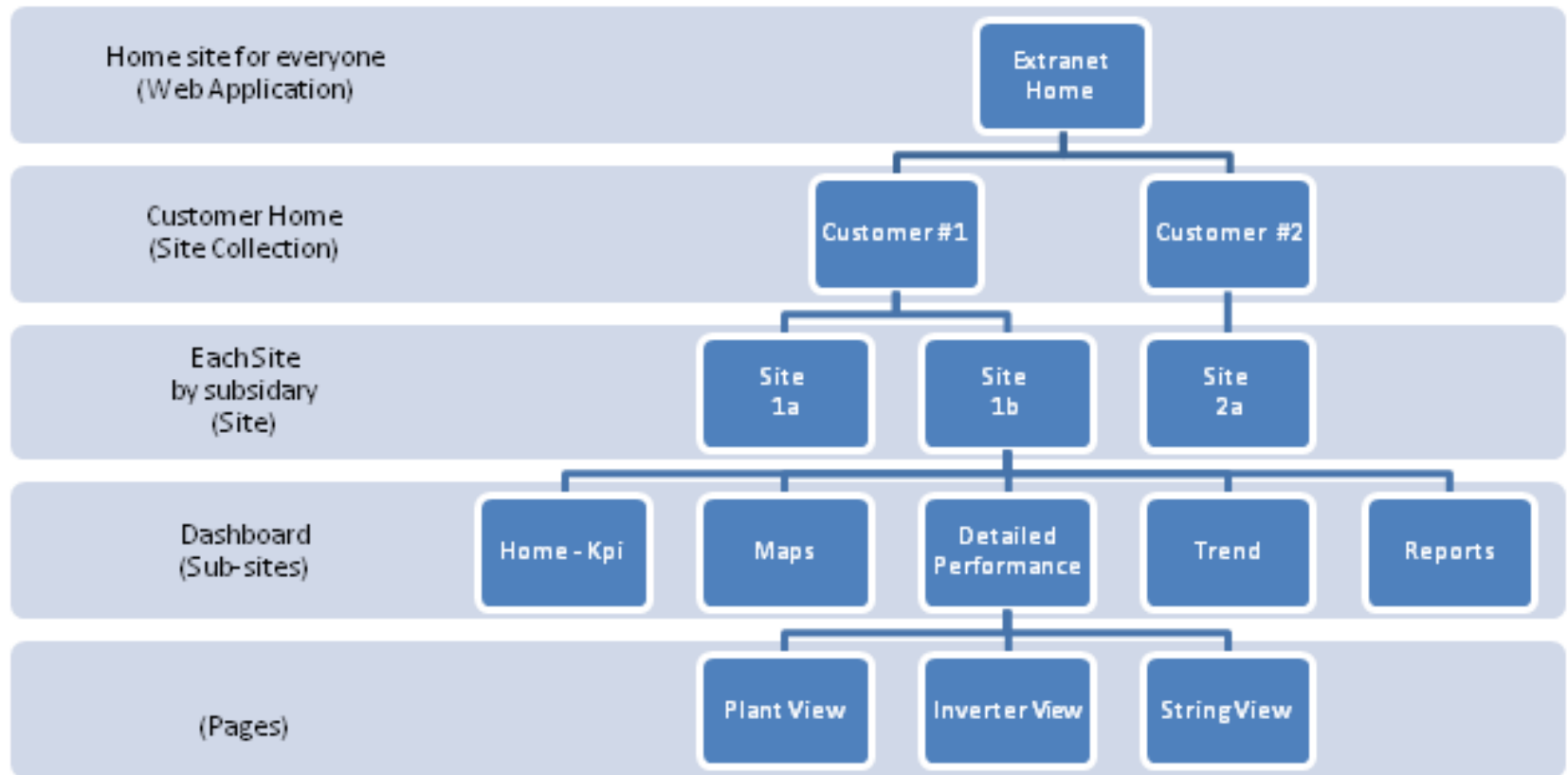
	Houston				Little Rock			
	To Date	Today	Target	Trend	To Date	Today	Target	Trend
Safety	0	0	0	🟢	0	0	0	🟢
Environment	97.1	97.0	99.0	🟡	98.6	98.6	98.6	🟢
Energy Savings	0.4%	0.4%	0.5%	🟡	0.5%	0.7%	0.7%	🟡
Quality	97.6	97.9	97.3	🟢	97.3	97.6	97.6	🟢
Reliability	95.7	96.4	95.6	🟢	95.6	96.3	96.3	🟢

SharePoint KPI web part



Excel services web part (PI OLE-DB)

SharePoint site Collection Hierarchy



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QUESTIONS?

www.sunpowercorp.com

