

PV Magazine Quality Roundtable

Suncycle GmbH

23. Juni 2016 | Intersolar Munich

Quality matters.

On-site experiences to assure performance and minimize risk.



01 Overview

The topics.

Quality matters – On-site experiences to assure performance and minimize risk.

The topics:

- | | |
|---------------------------------|--|
| 1. Suncycle GmbH | – Leading full service supplier in Europe/US |
| 2. Suncycle Maintenance Journey | – Supporting tools for O&M processes |
| 3. Details | – Examples of supporting tools |
| 4. Costs & Benefits | – Efforts & Results |

02 Suncycle GmbH

Leading full service supplier in Europe.



2007

Foundation of Suncycle Solar Services.

2,000,000

Industrially repaired and tested modules.

Close to customers

Fast access to destinations in Germany & EU.

International

Technical customer support in 5 languages.

200 service engineers

Broad range of skills in local markets.

Individual

Modular service packages.

Unique

Suncycle's mobile labs for precise on-site tests.



After-Sales Services

- Complete outsourcing
- 1st to 3rd level support
- Hotline in 5 languages
- Suncycle - ticket system



Test & repair

- EL & IR thermography, flash- & isolation tests
- Diodes & junction box, frame & coating
- All components



Operations & Maintenance

- 24/7 yield & failure monitoring
- inspection & maintenance
- Repair-cost insurance



Recall management

- Product recalls
- Failure correction
- Process- & cost documentation



Engineering

- Legally accepted reports
- Independent assessments
- Process developments & -certification



Supply chain solutions

- Incoming & outgoing goods inspection
- Warehouse management
- Consignment stock

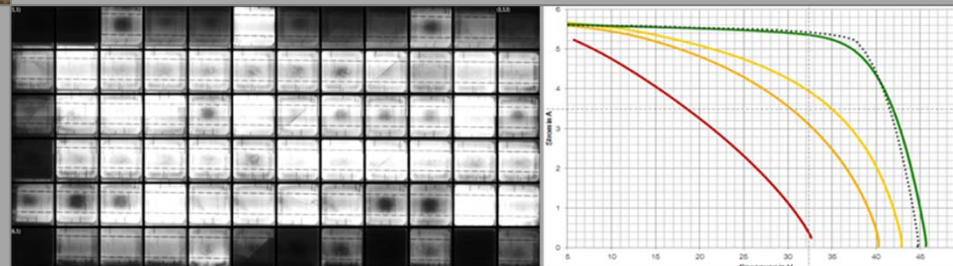
03 Suncycle GmbH

Selected references from Suncycle.



Performance assessment
on site >150 MWp in 2015-16

PID detection & healing
for >50MWp | for >600 plants



repair of junction boxes
and back sheet
> 500,000 modules

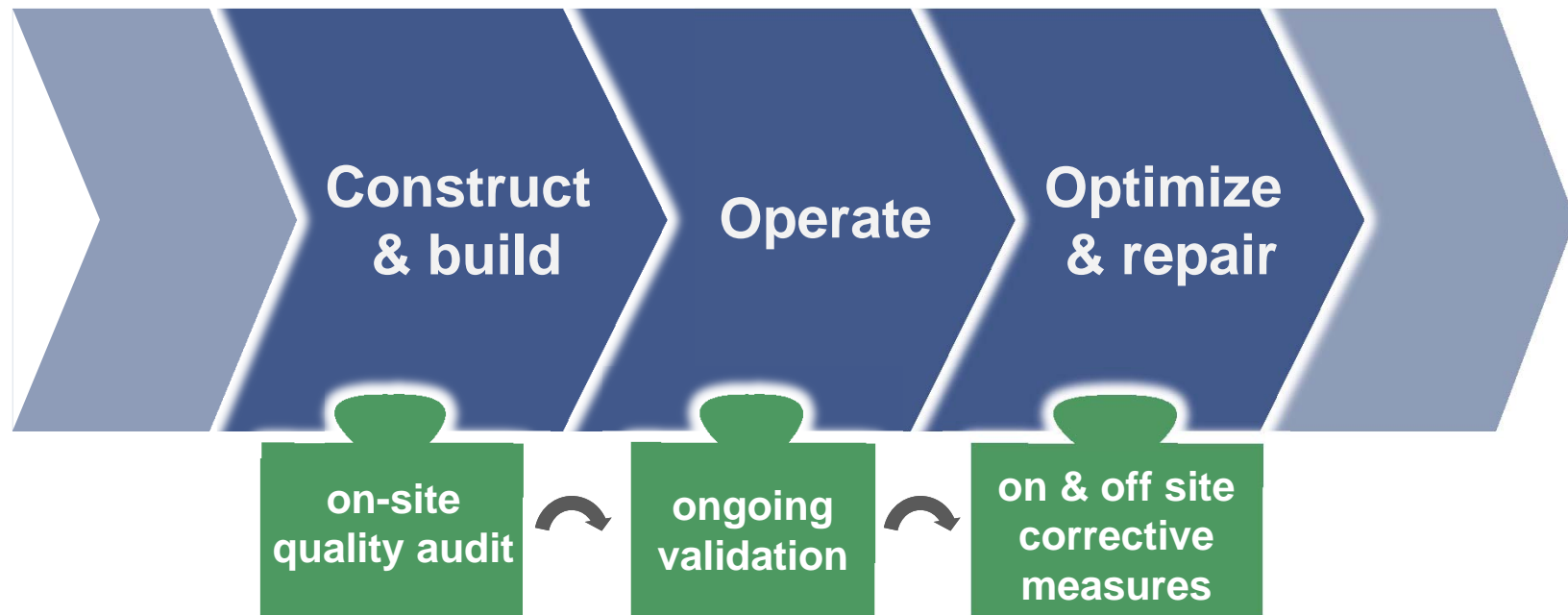
Plant optimization
statics & construction
>1.000 plants



04 Suncycle Maintenance Journey

Selected service packages to support O&M processes.

Today's focus on supporting tools for solar modules.



05 Construction & building of PV-parks

Good O&M needs a solid base.

On-site quality audit

- Don't trust generic module data sheets from the industry
- Installation of known & assessed quality
- Check for transport and handling damage
- Sample test before installation should be standard



Result: actual STC performance & EL-pictures.



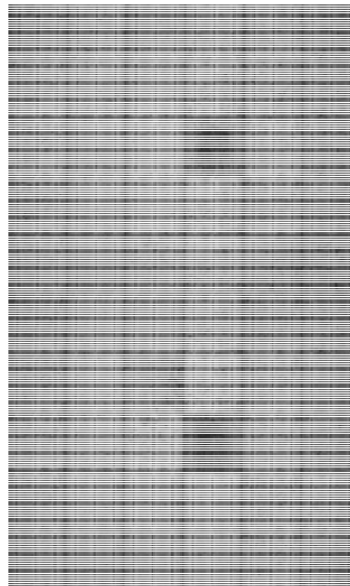
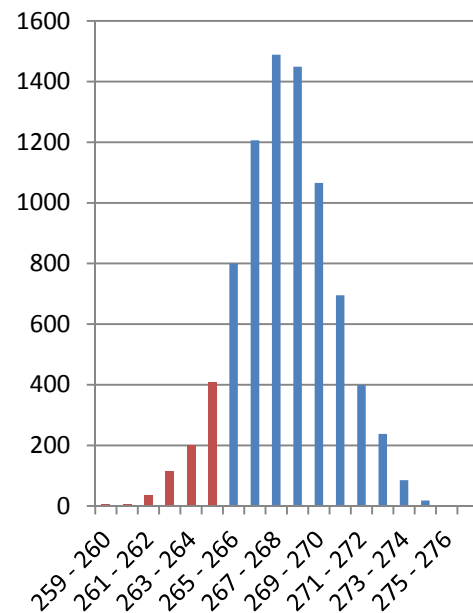
06 Construction & building of PV-parks

Good O&M needs a solid base.



Value of on-site quality checks:

- Documentation of real installed quality
- An unchallengeable basis for all future tests
- Better product from manufacturer through tight control
- Increased park value plus less money for risk reserve



07 Operating PV parks

Good O&M needs real performance data.



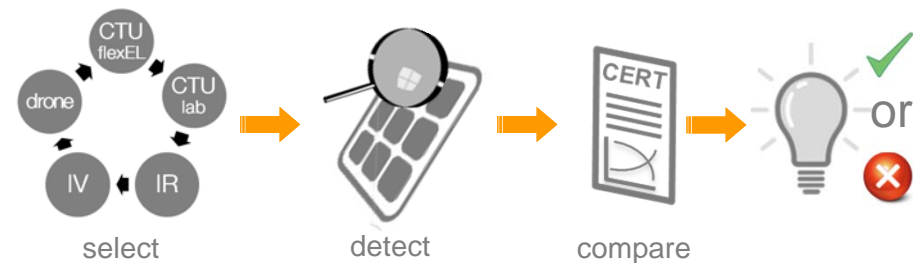
Result:
Get absolute clarity based
on the real-time data sheet!

Early detection of emerging problems

- Perform recurring tests with a selected sample of strings throughout the park to track real-time degradation
- Performance issues can be detected in a very early stage ("pre-effect")

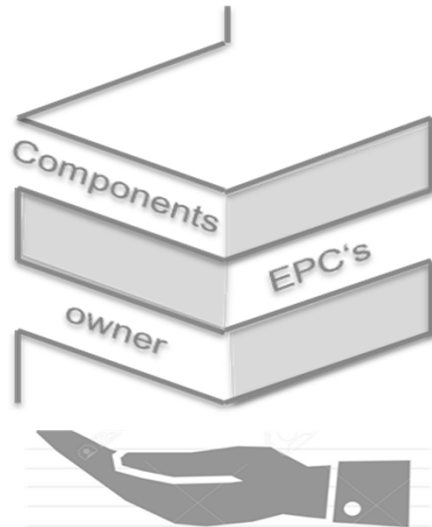
Professional performance interpretation

- On-site test data plus regular monitoring enables transparency on module performance
- Both together allows calculation of ideal service time
- Result: optimal balance between too early or too late corrective actions



08 Optimize & repair PV parks

Good O&M needs professional correction.



Service support from a single source

- Qualified and authorized correction methods
- On site intervention and workshop support (if needed)
- Experienced in claim handling (guarantees/ warranties)
- Timely reaction to avoid and reduce potential losses
- Professional selective service partner network
- Direct dealing with tier1 component suppliers
- Own service teams – quality under direct control



09 Cost scenarios I

Comparison of efforts and results.

On-site incoming module inspection for
approx. 0,0033 €/Wp

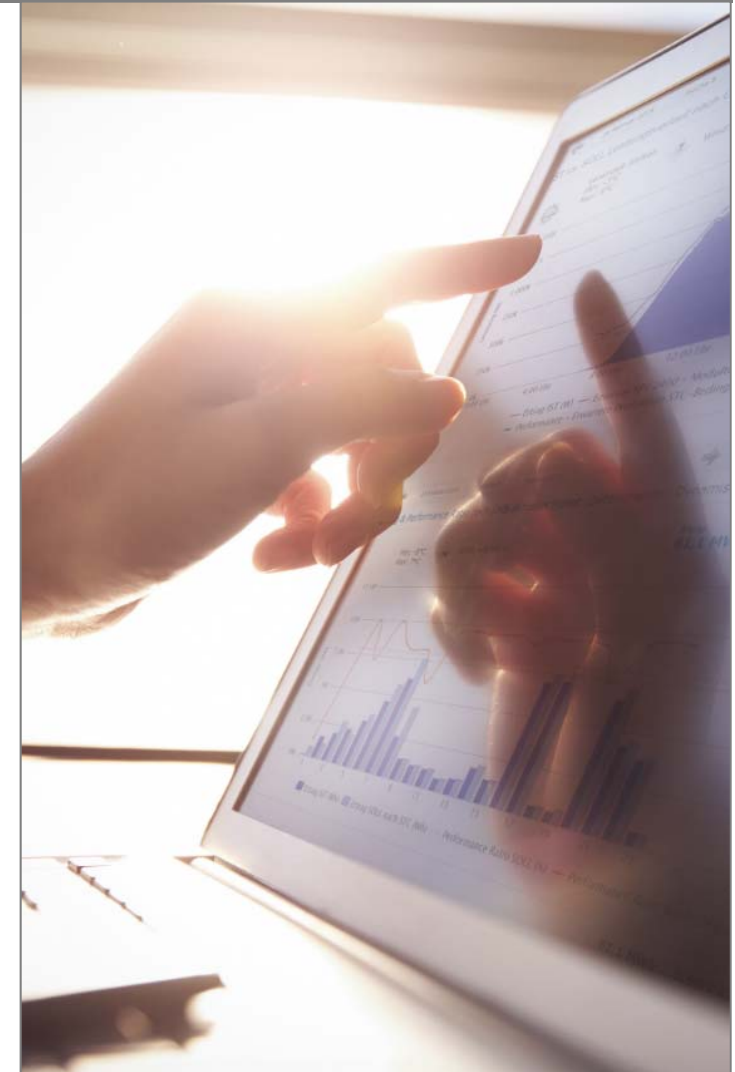
Ex.: 10 MWp installation

Inspection cost of approx. 33.t €

Purchase volume of approx. 4,5 Mi.€

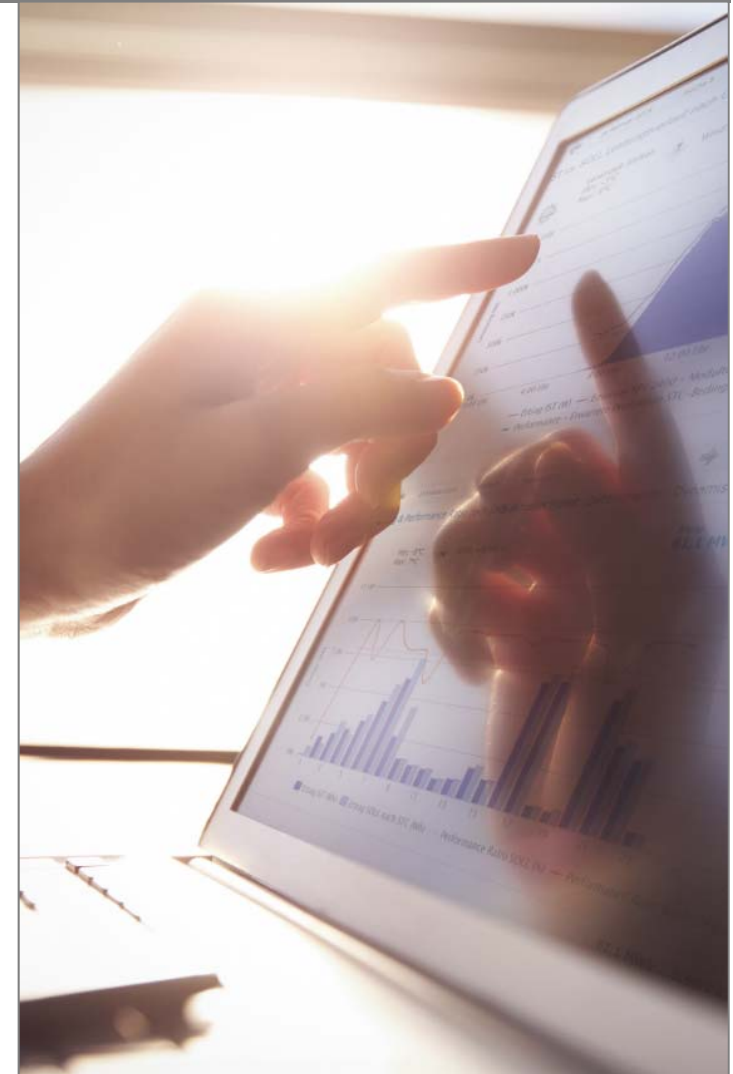
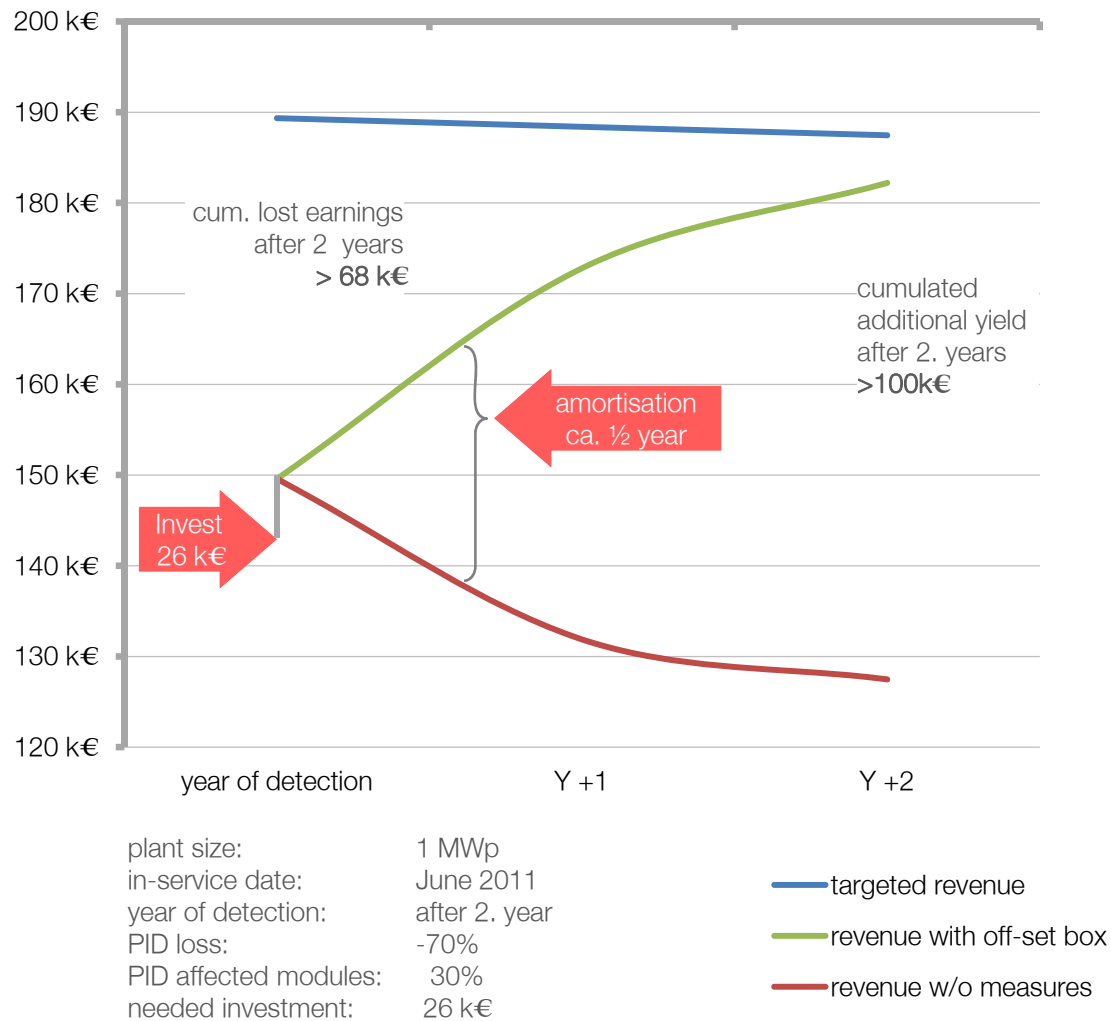
Negotiated security/ quality deposit 5%

- Retain 225t€ for quality check results discussion
- Trigger quality management at supplier
- Minimize surprises during operations



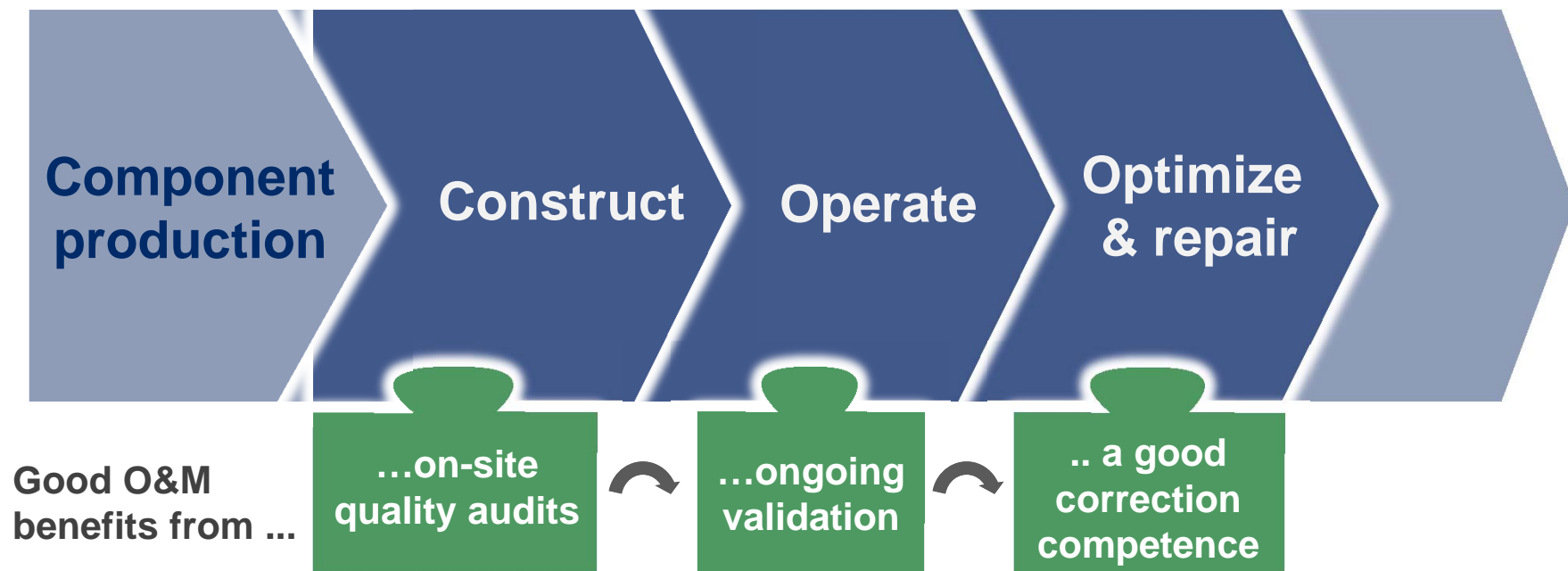
10 Cost scenarios II

Comparison of efforts and results.



11 Suncycle Maintenance Journey

Selected service packages to support O&M processes.





Thank you for your attention!



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