Holistic view on risk mitigation strategies throughout the system lifecycle

14:30 Session 1

- Discussion: **How to mitigate risks when selecting components?**
- Discussion: **How to mitigate risks in the planning and building phase?**

15:30 „active" break with 6 posters

15:50 Session 2

- Discussion: **How to deal with existing plants?**
- Presentation: **Latest field survey results with climatic segmentation**
  Stephan Padlewski (DuPont)
- Presentation: **IV curve diagnosis**
  Hariram Subramanian (Huawei)
- Presentation: **Quantifying Risk: CEA's new scoring system based on audit results**
  George Toloupas (CEA)

16:45 End of the 5th pv magazine Quality Roundtable

5th Quality Roundtable
at Intersolar Europe 2017

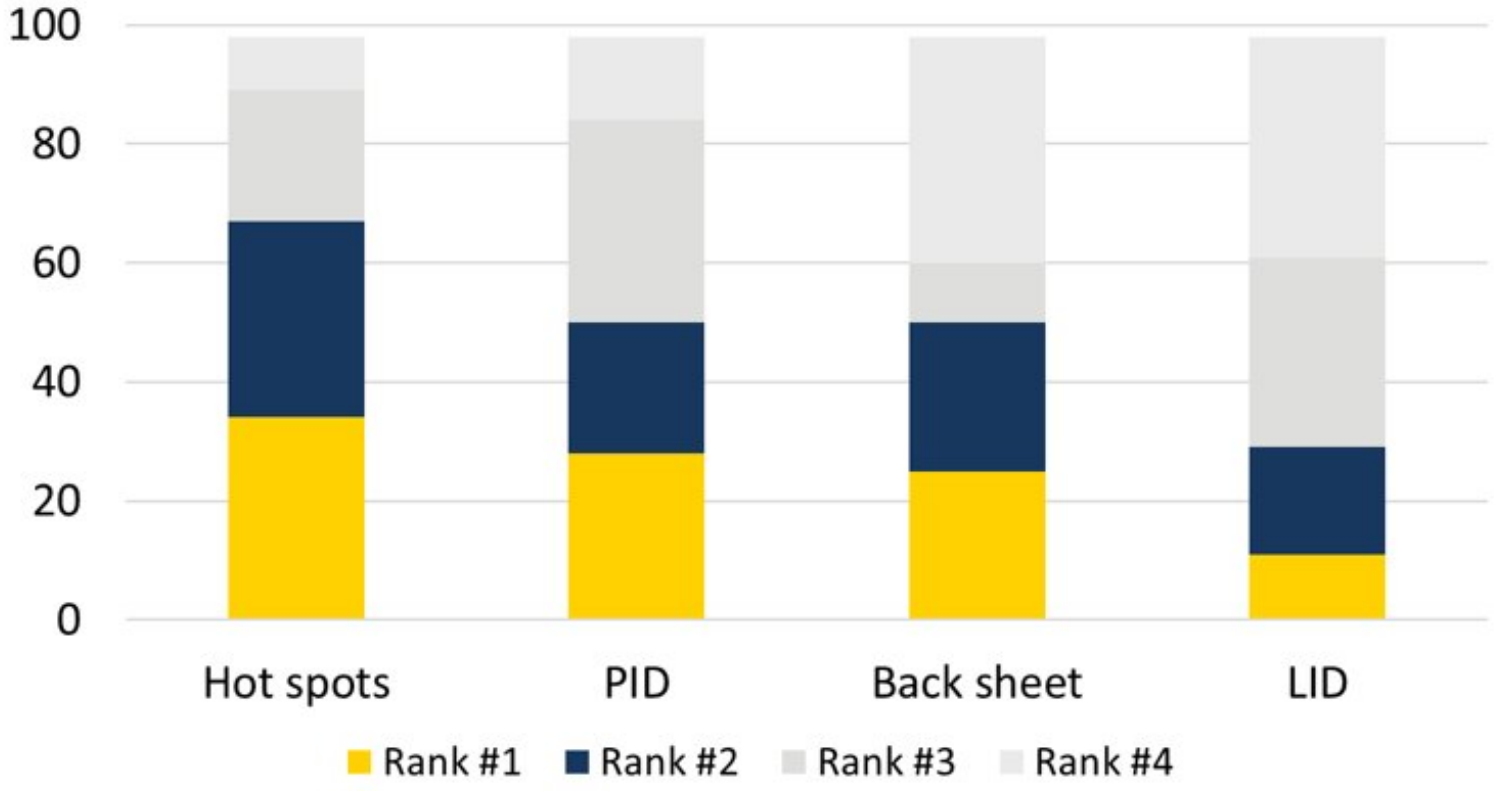
Holistic view on risk mitigation strategies throughout the system lifecycle

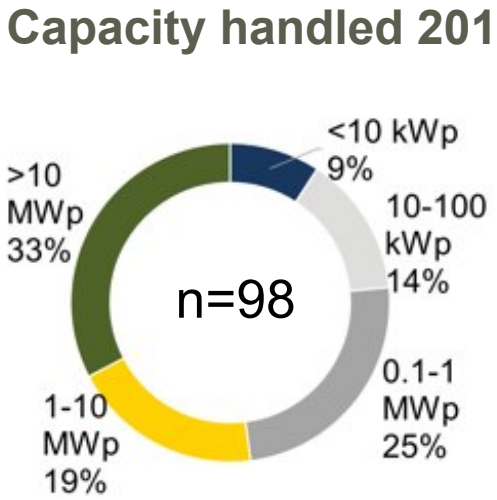
Initiative partner

Gold sponsors

pv magazine surveys

Online survey:





+ qualitative interviews with 8 investors

In collaboration with Stephan Franz, Buro F

How to mitigate risks when selecting components?

That is why

TÜV Rheinland

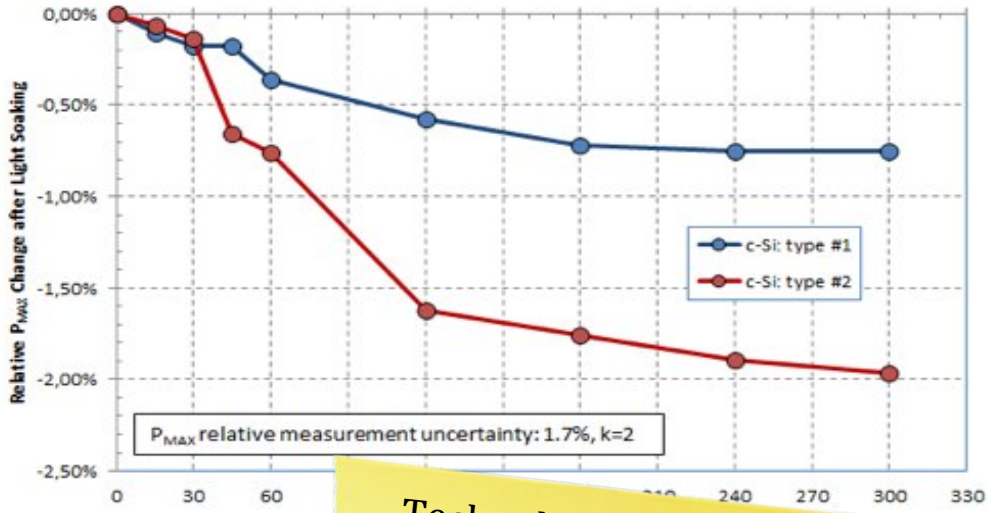
Excerpt from Quality Monitor 2017

TÜVRheinland®
Precisely Right.

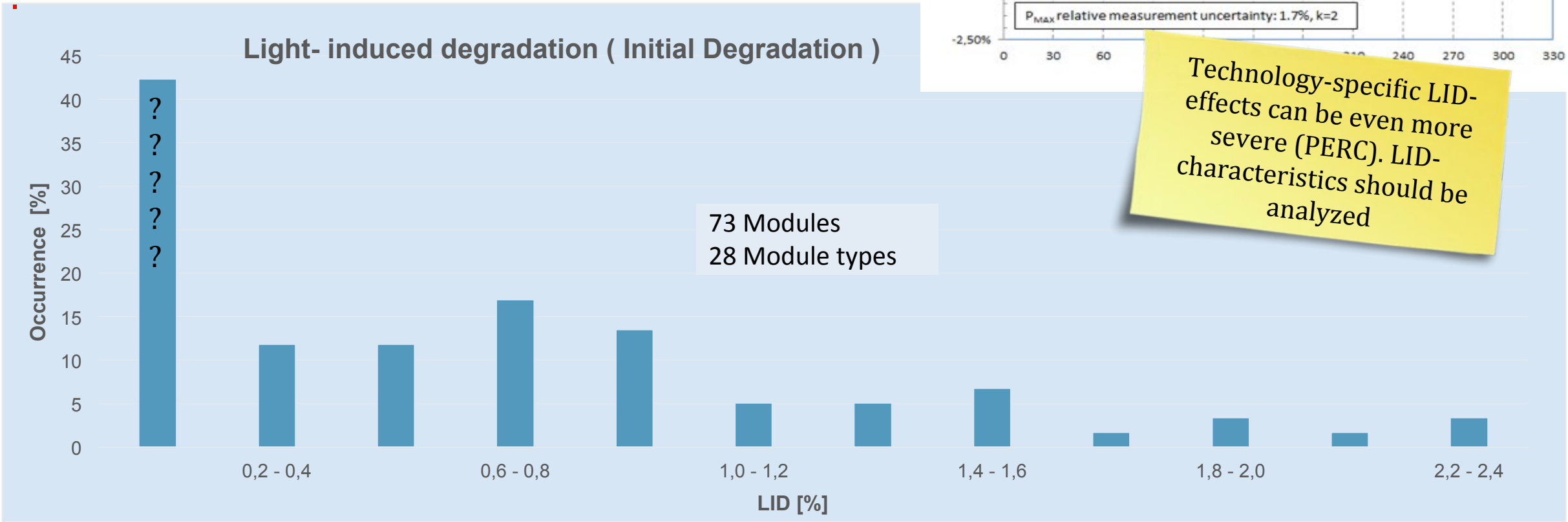
PV Module Performance

Underperformance and Influence of Light Induced Degradation

20 % (probably more) of the tested modules degrade more than 1 % with a respective loss in annual revenue.



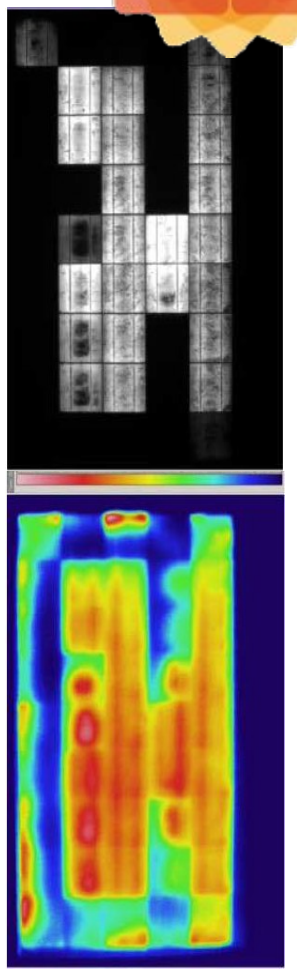
Technology-specific LID-effects can be even more severe (PERC). LID-characteristics should be analyzed



Potential Induced Degradation

Quantification of the Economic Impact of Technical Risks

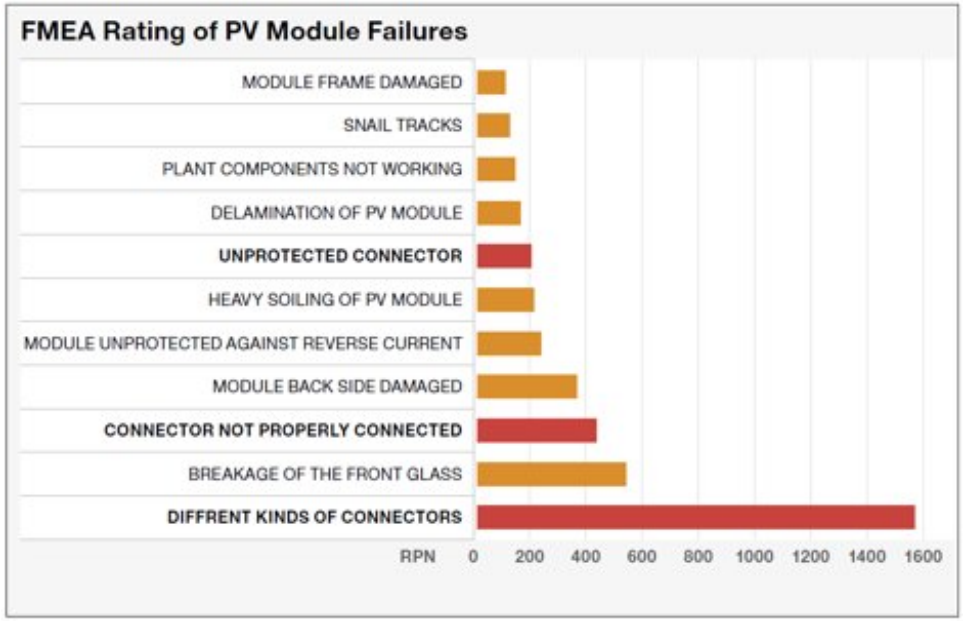
Description	Potential induced degradation is a performance loss in PV modules, caused by so called stray currents
Performance losses	8 % (failure rate 40 %, 20 % power loss of affected modules) 160 kWh/kWp/a (spec. yield 2,000 kWh/kWp) **700,000 $US/a** for 40 MWp plant (0.1 €/kWh)
Mitigation	Testing of the PV modules
Repair method	Installation of PV grounding kits
Cost to fix and repair	**100,000 $US** 2,200 $US per inverter x 40; incl. installation cost
Cost of mitigation measure	Testing of modules; **10,000 $US** for sample testing for PID resistivity 0.25 $US/kWp

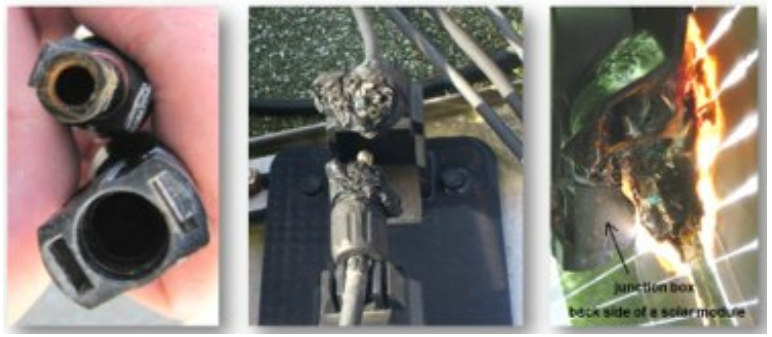


! **1.5 Mio $US** loss after 2 years incl. repair costs versus
10 k $US mitigation costs

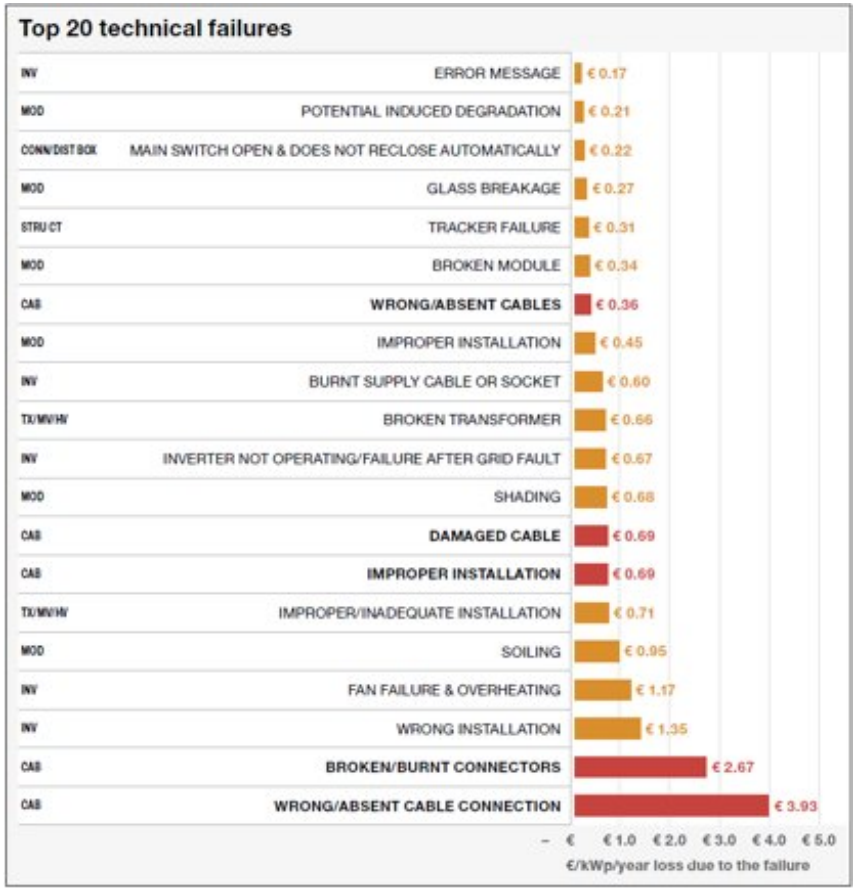
Failures and their financial impact

FMEA (Failure Modes and Effects Analysis) by TUV Rheinland



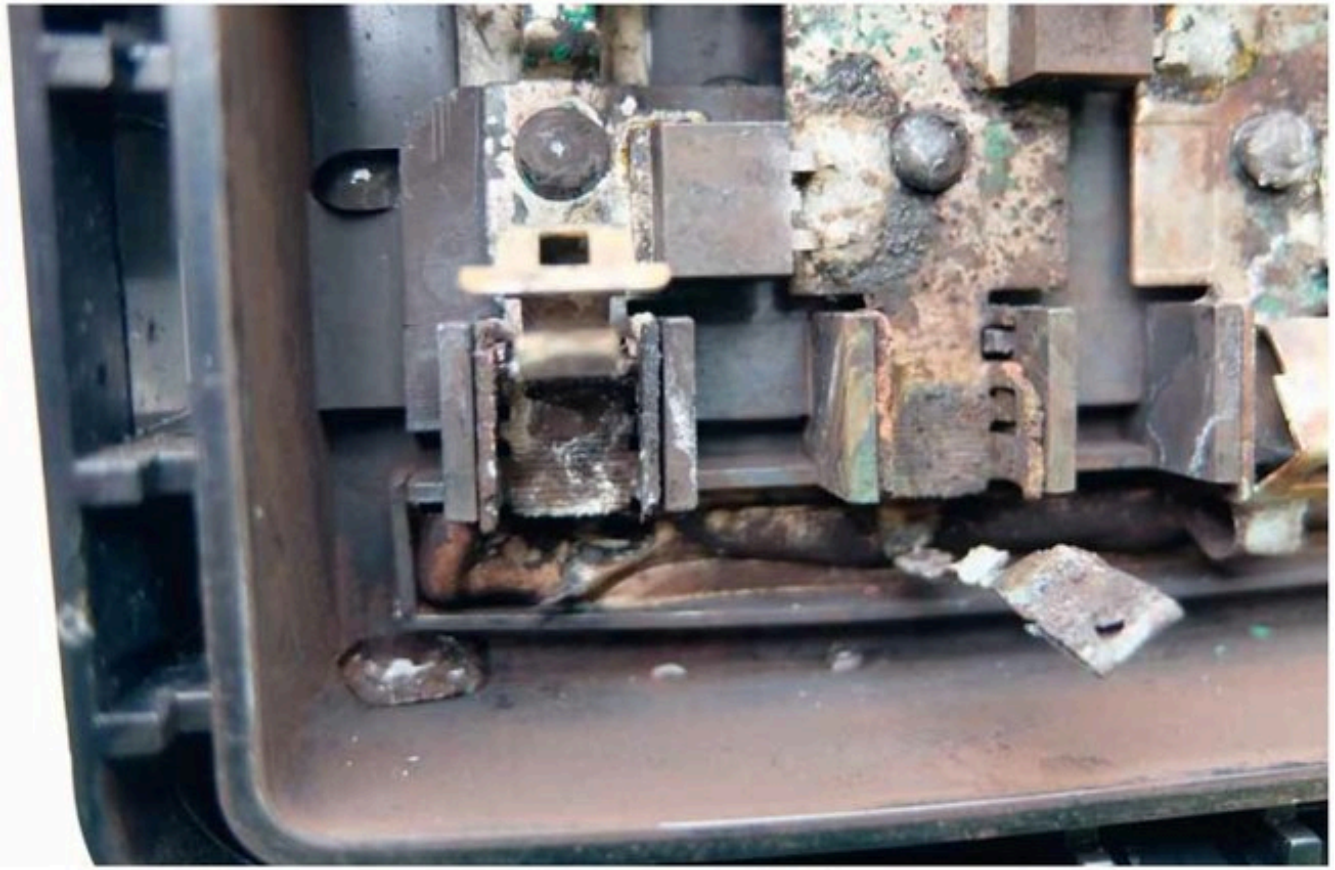


FMEA CPN (cost priority number) Solar Bankability project by European Commission's Horizon 2020



How to mitigate risks in the planning and building phase?

That is why



How to mitigate risks in the planning and building phase?

That is why

Eckhard Fleiß, Ing.-Büro Fleiß
Michael Blödner, Eon-Solarprofis

- Don‘t use the cheapest products
- Design for easy maintanance
  - don‘t lay cables in the ground
  - use disconnect terminals (e.g. in combiner boxes)

See:
It is not sufficient to rely on certification of solar cables
Micro Sieg in pv magazine Deutschland
June 2017, page 98

5th Quality Roundtable
at Intersolar Europe 2017

Holistic view on risk mitigation strategies throughout the system lifecycle

Initiative partner

Gold sponsors

And the winner is…..

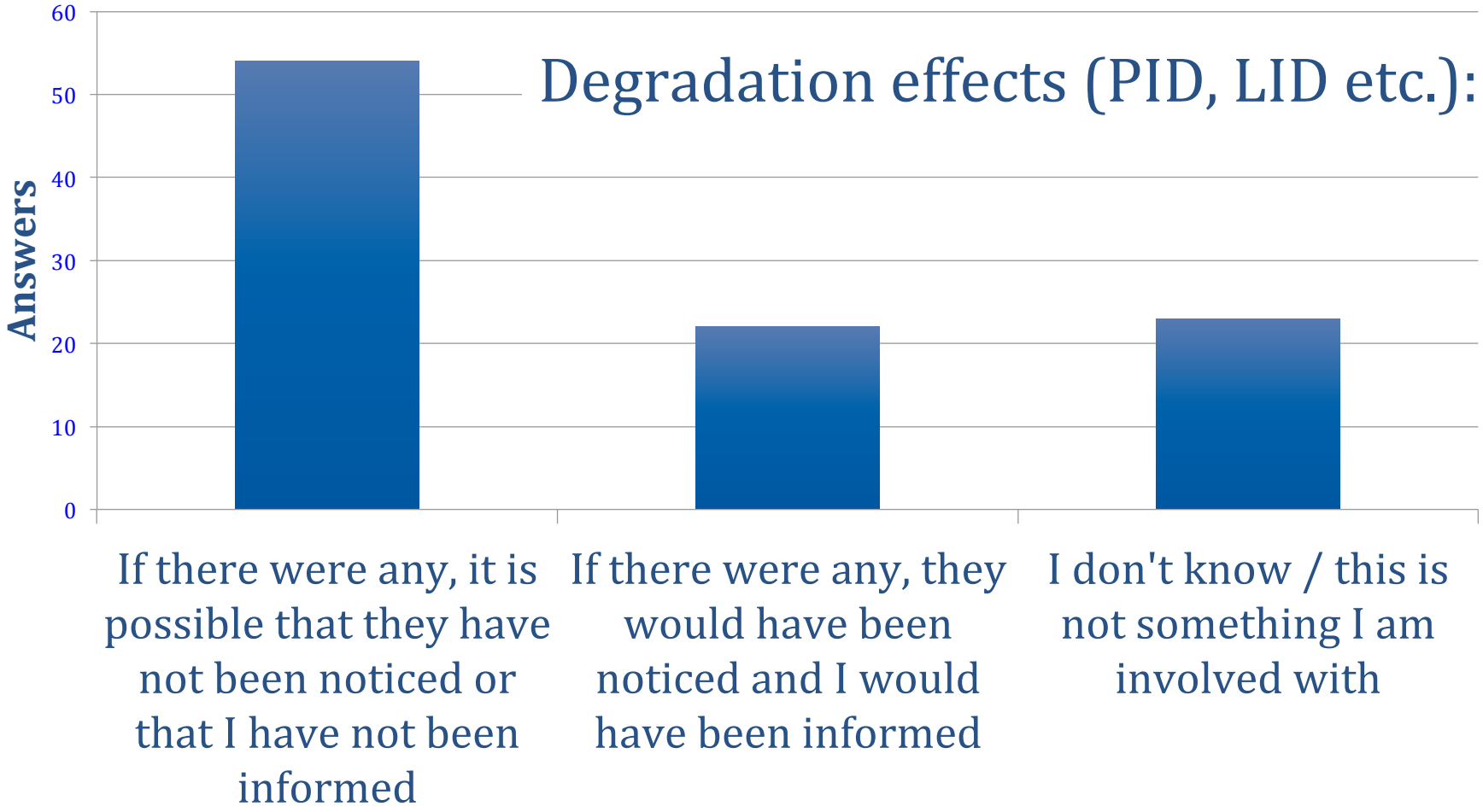
Is cheap thermography possible?

II Poster session

1. The journey from bad quality to a repowered plant (Hans Urban, Schletter)
2. Serial defect or not: The case of a solar plant where water penetrated the junction boxes (Armansperg, Kleefisch)
3. Adopting New Testing Standards to Avoid Backsheet Failures (DuPont)
4. Mitigating Strategies for Hot Spots in c-Si Solar Panels (DuPont)
5. Quantifying Risk: CEA's Quality Assurance Benchmarking Program (CEA)
6. Cabling of PV Installations – Small components. Big impact. (Multicontact)
7. PID: Field monitoring data evaluation and climate chamber tests with field modules.(TÜV Rheinland)

How to deal with existing plants?

That is why:



III Presentations

Latest field survey results with climatic segmentation
Stephan Padlewski, Marketing Manager EMEA, DuPont Photovoltaic Solutions

I-V Curve Diagnosis
Hariram Subramanian, CTO, Huawei Solar Europe

Quantifying Risk: CEA's new scoring system based on audit results
George Touloupas, Director of Technology and Quality, CEA

Please make sure that

we have got your contact details,

get the material

and answer our feedback survey next week.

Thank you very much!

Feel free to contact us:
jonathan.gifford@pv-magazine.com
michael.fuhs@pv-magazine.com

See you at our next Quality Roundtable in…

- Las Vegas
- Greater Noida
- Taipei

SOLARPOWER INTERNATIONAL

Renewable Energy India Expo
A UBM Event
20-22 SEPTEMBER, 2017
India Expo Centre, Greater Noida

PV Taiwan
Taiwan Int'l Photovoltaic Exhibition

pv magazine group