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pv magazine webinars

Bridging the certainty gap through a new partnership in quality assurance and insurance

30 March 2022

10:00 am – 11:00 am | CEST, Berlin
9:00 am – 10:00 am | BST, London
3:00 pm – 4:00 pm | Hanoi
4:00 pm – 5:00 pm | CST, Beijing

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Bridging the certainty gap

Increasing the long-term profitability of solar PV investments

Green Tech Solutions, Munich Re
Julia Moser | Simone Steinbach

Munich RE

Image: the_burtons / Getty Images

Munich Re's PV Warranty Insurance

A dynamic market calls for a reliable partner

Munich RE

- More than $3bn exposure in support of over $40bn capital in green technologies
- Over 1,000 insured projects and manufacturers in 80 countries 41 GW insured
- In-depth expertise due to industry experts in-house
- Own test field at research center
- More than 300 PV manufacturing sites audited

Global organization
with regional go-to experts

140+ years
of risk expertise

50+ years
climate change expertise

10+ years
in renewables

AA- rated
company

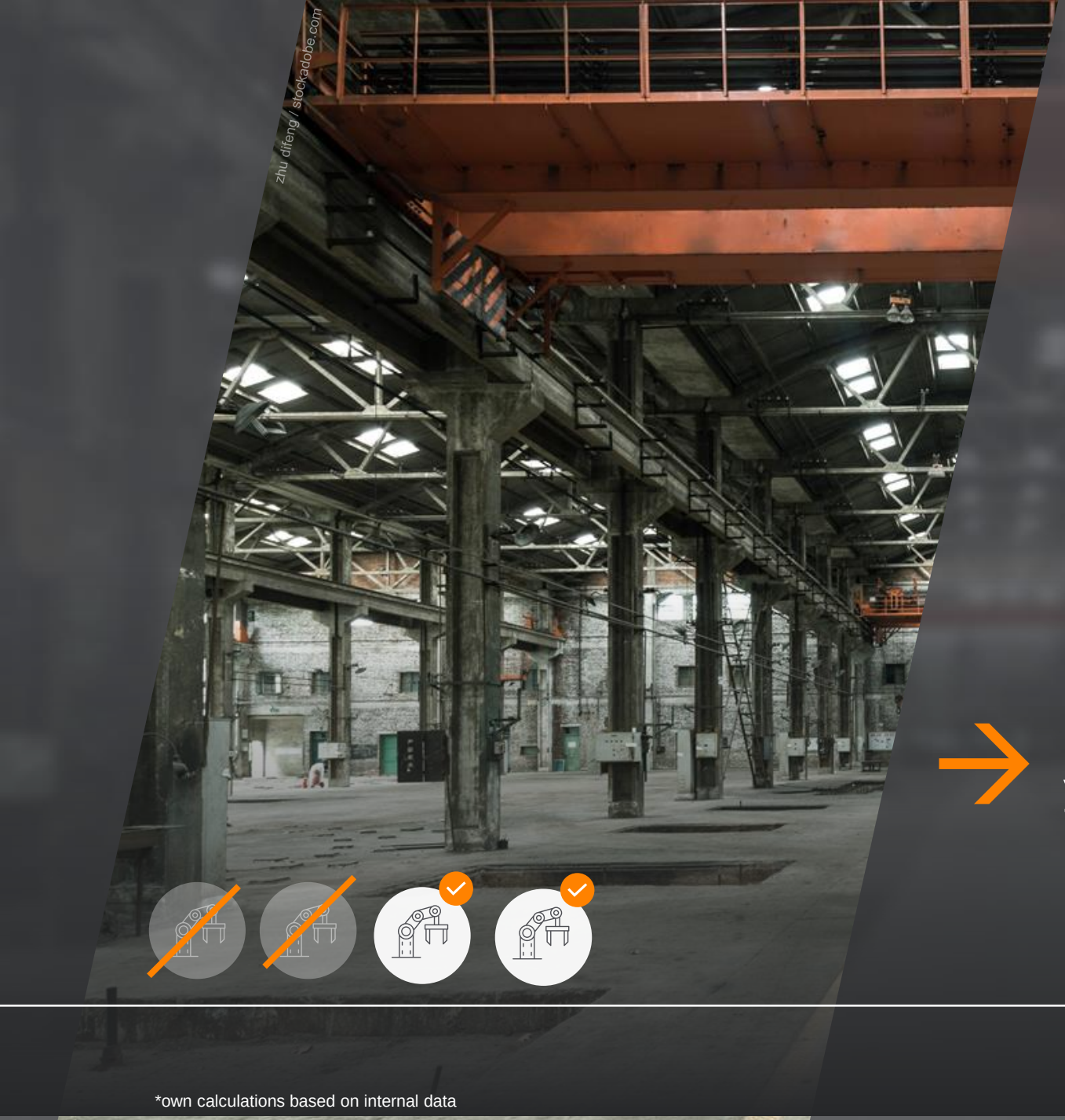
World-class partnerships
with industry associations, research and certification institutes

VDE RENEWABLES

TÜV Süd

Fraunhofer Institut

kiwa



Munich RE

50%

of larger PV Module Manufacturers have gone from the market in the past 10 years.*

- with the manufacturer's insolvency the warranty on PV modules expires
- You can't claim warranty in the case of technical underperformance of your panels any longer

→ Suddenly you bear the full risk of your long-term solar investment.

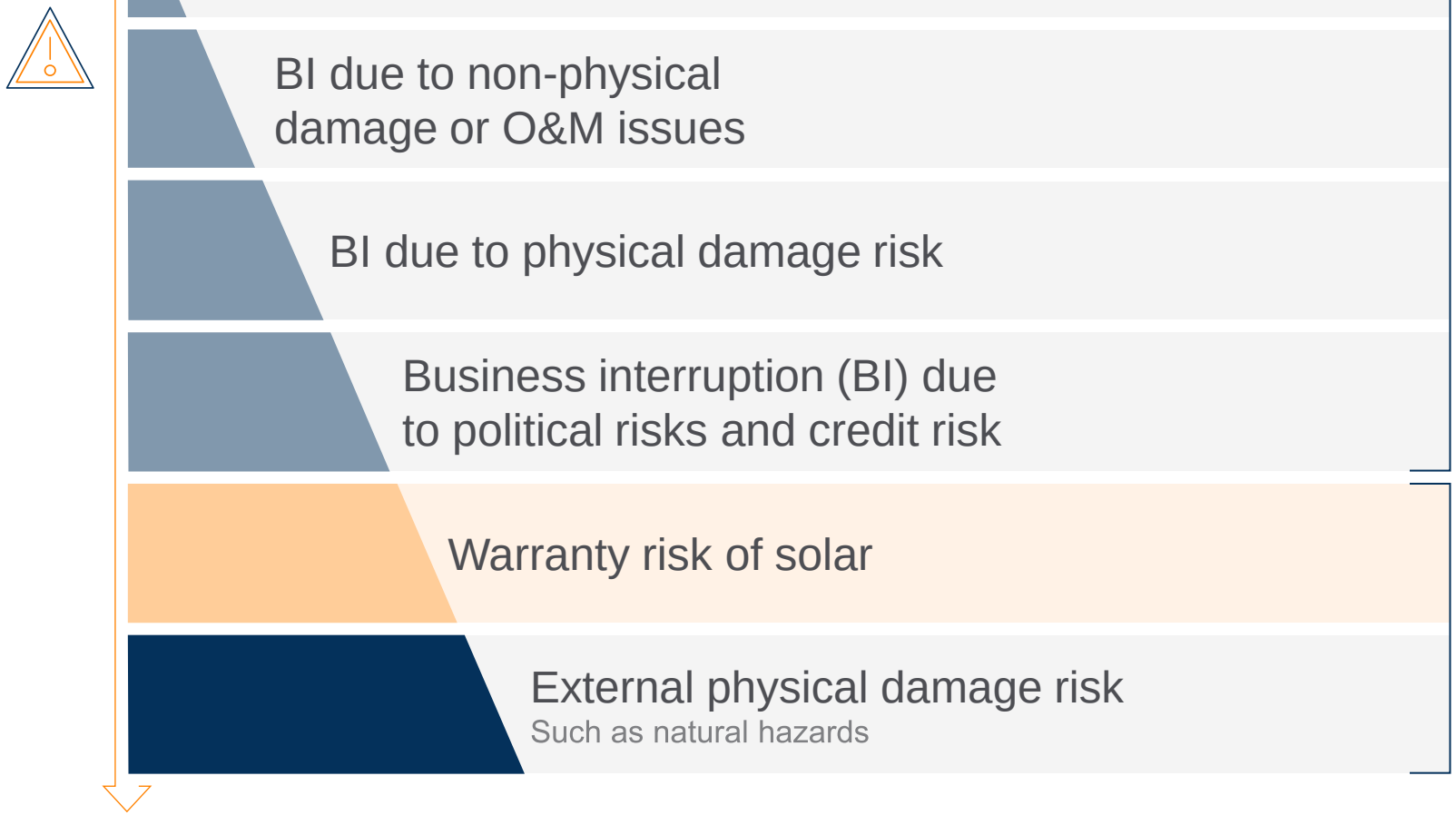
30 years

*own calculations based on internal data

Risk pyramid according to **severity**

25 year of operational phase: The Warranty Risk of Solar is a fundamental risk

Severity of the risk



Temporary loss of revenue

Highest priority for mitigation at the base of the pyramid

Threat to material assets of the project

Munich RE

We offer…

the certainty that your solar investment **is profitable in the long run**

planning security against **warranty risks**

bankability for more attractive financing terms

30 years

Munich RE

Munich Re’s PV Warranty Insurance
protects you against:

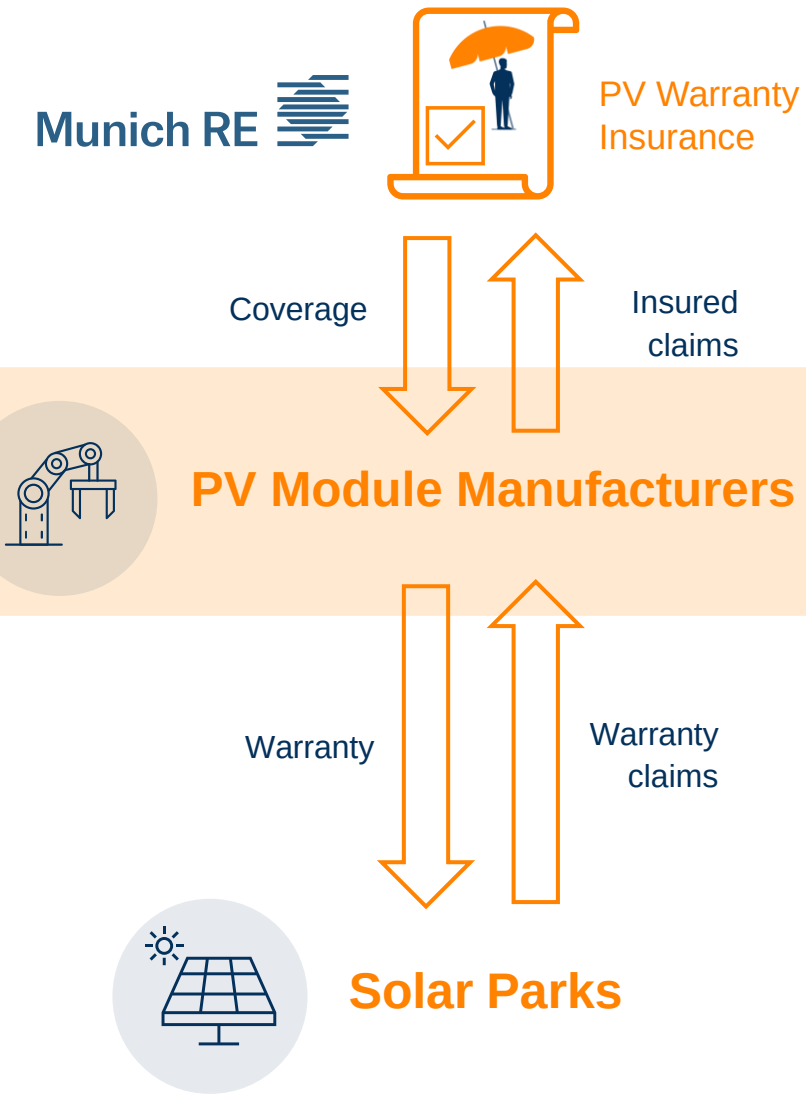
- Technical underperformance of panels
- Insolvency of PV module manufacturer

And makes sure your solar investment is still profitable in more than **20** years

30 years

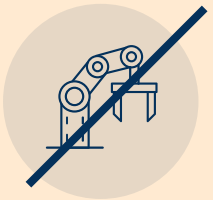
Munich Re’s PV Warranty Insurance

Makes sure your claims are covered



Munich Re’s PV Warranty Insurance

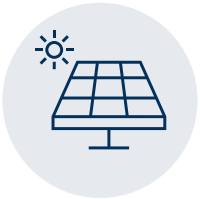
Makes sure your claims are covered



Coverage

Warranty
claims

Insolvency



Solar Parks

Munich Re's PV Warranty Insurance

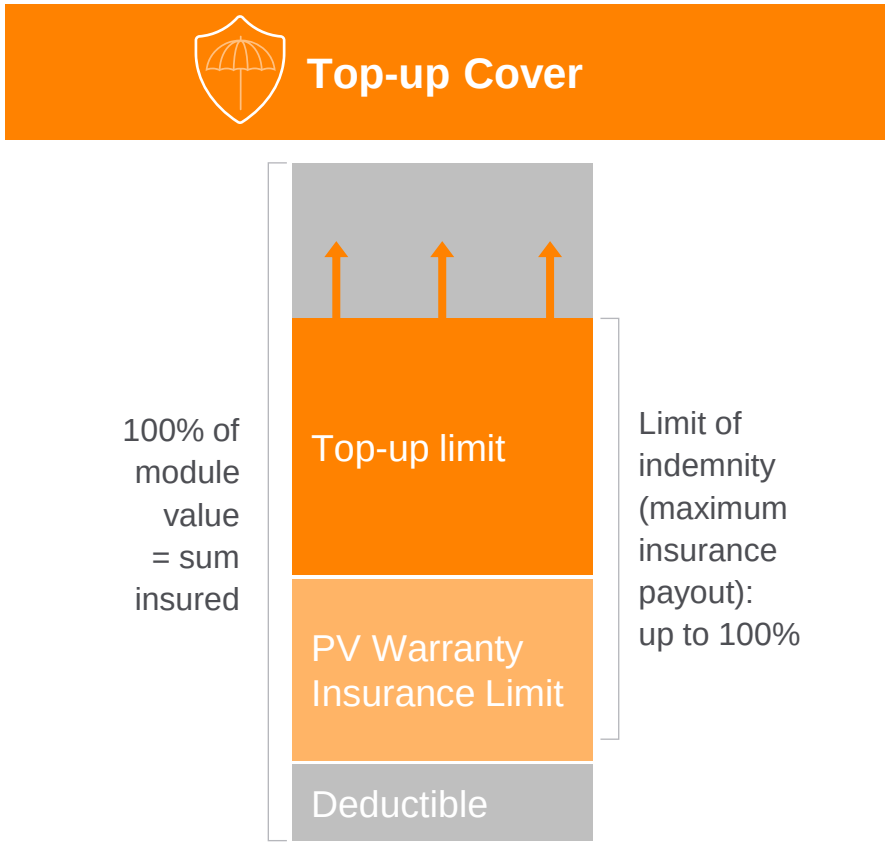
Supplemented by an additional safety net: Top-up Cover

If you have **additional protection needs**, talk to us about our **Top-up Cover** tailored for investors and park developers

- Further improve the bankability of PV projects
- Increase their future transfer value

Limit of indemnity up to 100%

Tailored solutions to include risks such as cost of labor, transportation or loss of revenue



Munich Re's PV Warranty Partners

Module Manufacturers around the world

https://www.munichre.com/pvwarrantypartner

VDE Renewables

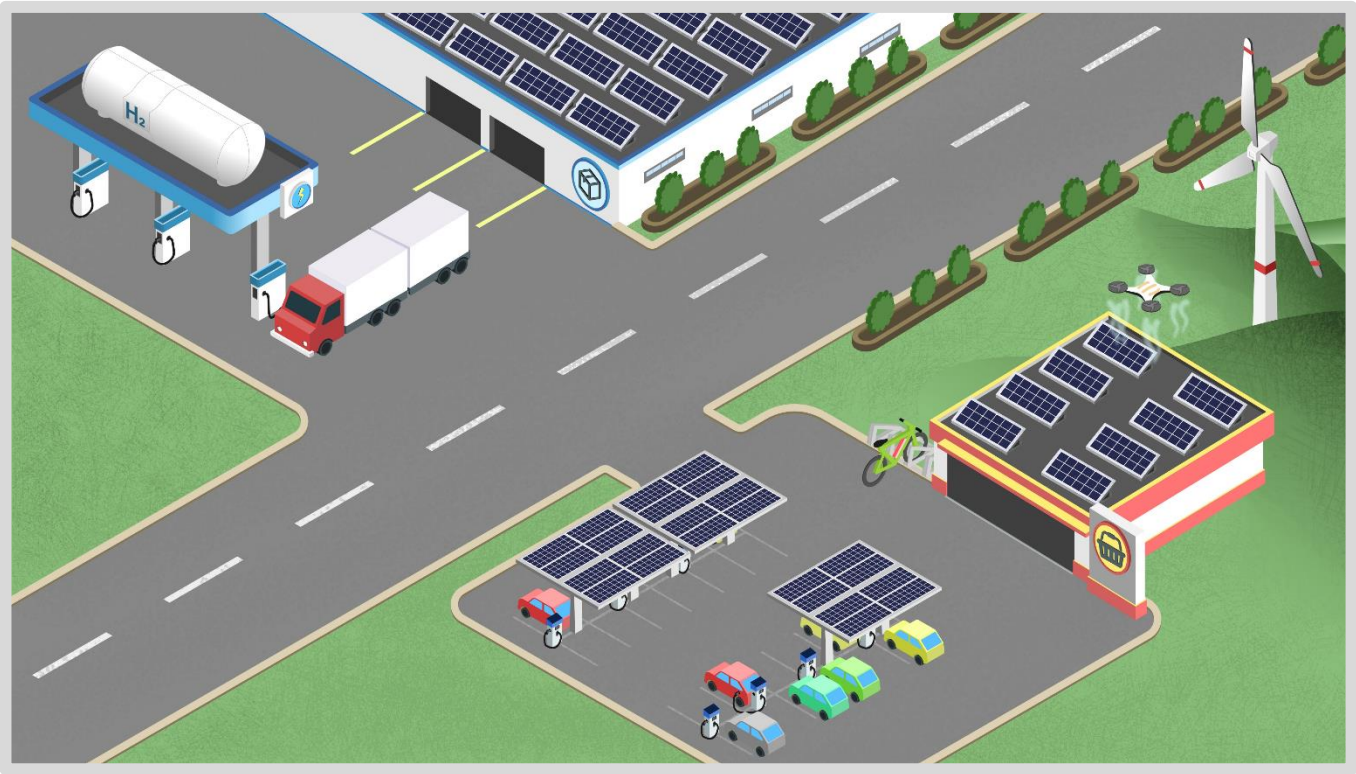
Increasing the long-term profitability of solar PV investments – A case study

Ulrike Jahn 30 March 2022

VDE RENEWABLES

A new era in the energy transition process

VDE´s one-stop shop for sustainable energy solutions



- Generation
- Storage
- Mobility
- Distribution

Tackling each Stage of the Solar PV Value Chain

End of life and second life

Standardization for second life applications and sustainable recycling

Operations and maintenance

Plant review and performance analysis
Failure analysis and claim management

Design and construction

Independent/Owner's engineering
Technical Due Diligence
Premium certification to support bankability

Product development and production

Standardization work for new technologies
Factory inspections
In-line Production supervision
Independent lab testing of products
Proof of concept and bankability studies

Transport and supply chain

VDE Supply Chain Cloud Platform
Product verification vs. fake products
Cooperation with logistics companies:
Standardization of green logistics
Monitoring of goods in transport

Independent Quality Assurance along the PV Value Chain

to reduce technical risks and ensure investor's return

Tailored premium certifications with extended technical and commercial test criteria.

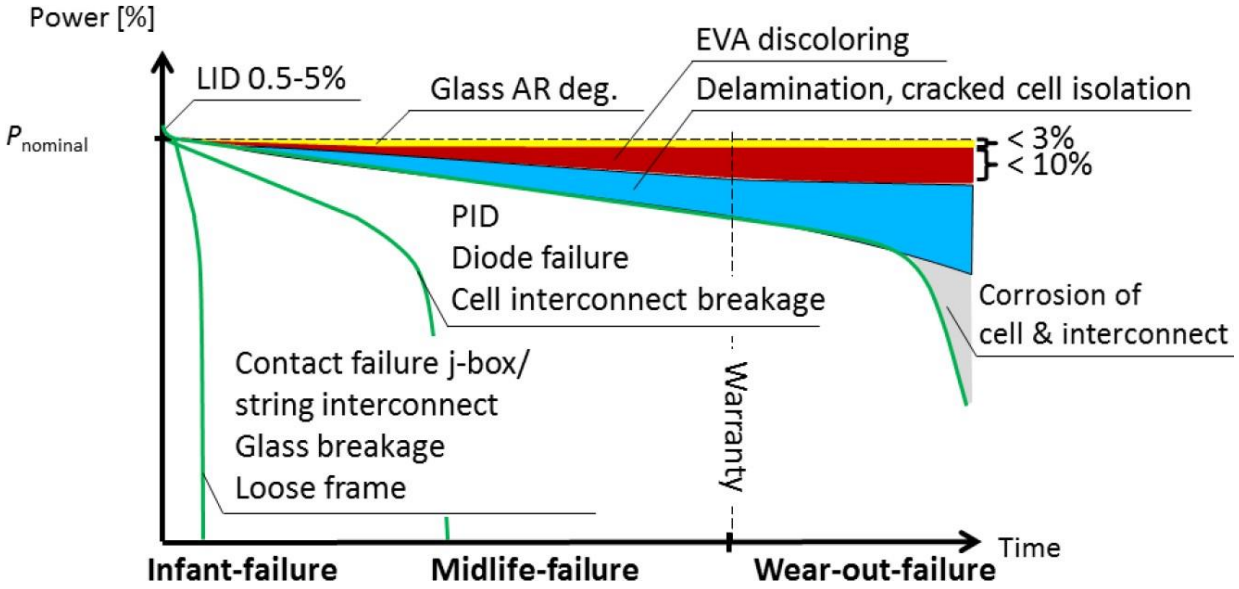
Technical Due Diligence for evaluation of concept, design, safety and performance of PV systems and components.

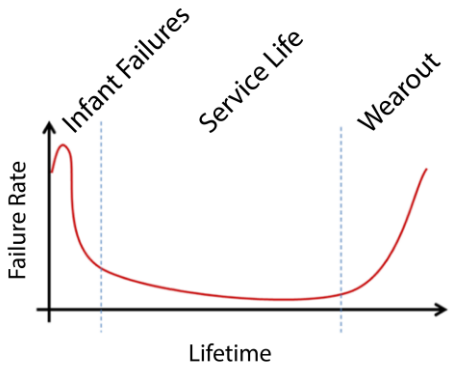
Enhance customers' unique selling points by offering innovative high-quality products and solutions.

Extended type approval testing and continuous conformity monitoring in production are strongly recommended.

The purchaser should test and ensure the quality of representative samples for large batches of PV modules delivered to PV projects.

Durability: Failure scenarios of crystalline silicon PV modules





M. Köntges, S. Kurtz, C. Packard, U. Jahn, K. Berger, K. Kato, T. Friesen, H. Liu, and M. van Iseghem, "Review of Failures of Photovoltaic Module". Report IEA-PVPS T13-01:2014

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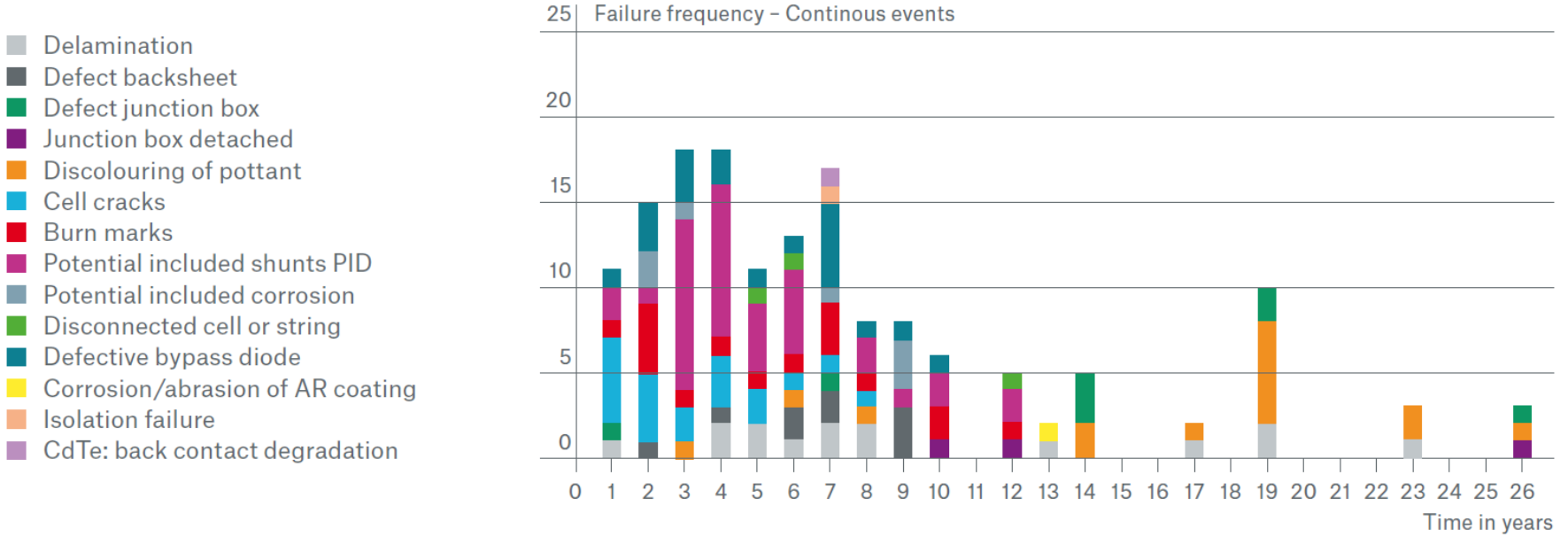
Frequency of PV module failures affecting system performance



M. Köntges, G. Oreski, U. Jahn, M. Herz, P. Hacke, K. A. Weiss, G. Razongles, M. Paggi, D. Parlevliet, T. Tanahashi and R. H. French. “Assessment of Photovoltaic Module Failures in the Field”. Report IEA-PVPS T13-09:2017

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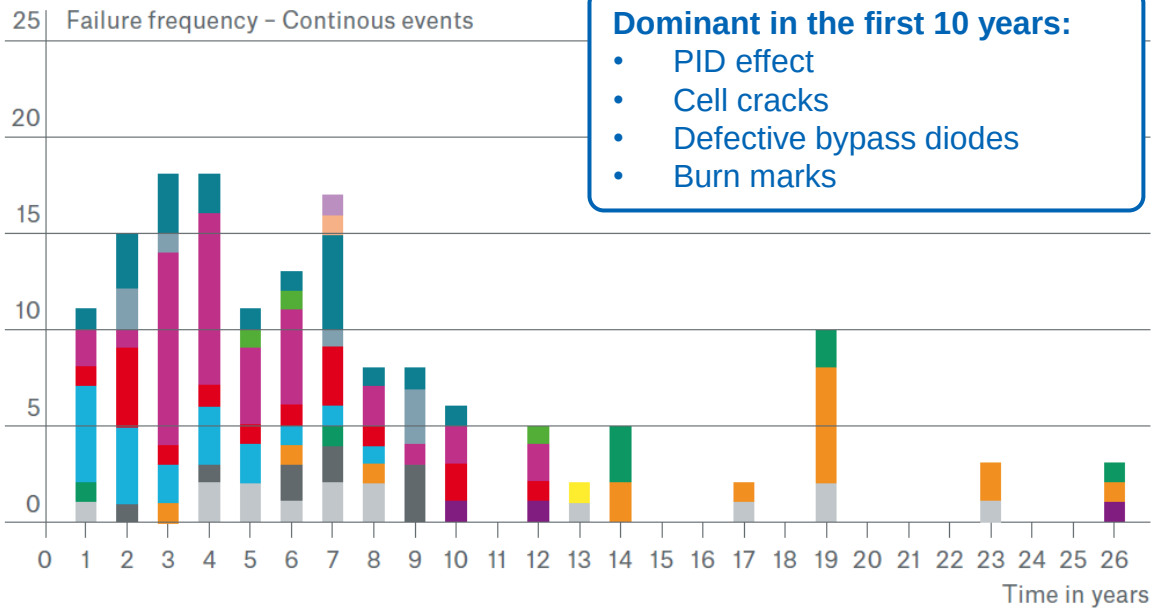
Frequency of PV module failures affecting system performance

- Delamination
- Defect backsheet
- Defect junction box
- Junction box detached
- Discolouring of pottant
- Cell cracks
- Burn marks
- Potential included shunts PID
- Potential included corrosion
- Disconnected cell or string
- Defective bypass diode
- Corrosion/abrasion of AR coating
- Isolation failure
- CdTe: back contact degradation



Dominant in the first 10 years:

- PID effect
- Cell cracks
- Defective bypass diodes
- Burn marks

M. Köntges, G. Oreski, U. Jahn, M. Herz, P. Hacke, K. A. Weiss, G. Razongles, M. Paggi, D. Parlevliet, T. Tanahashi and R. H. French. “Assessment of Photovoltaic Module Failures in the Field”. Report IEA-PVPS T13-09:2017

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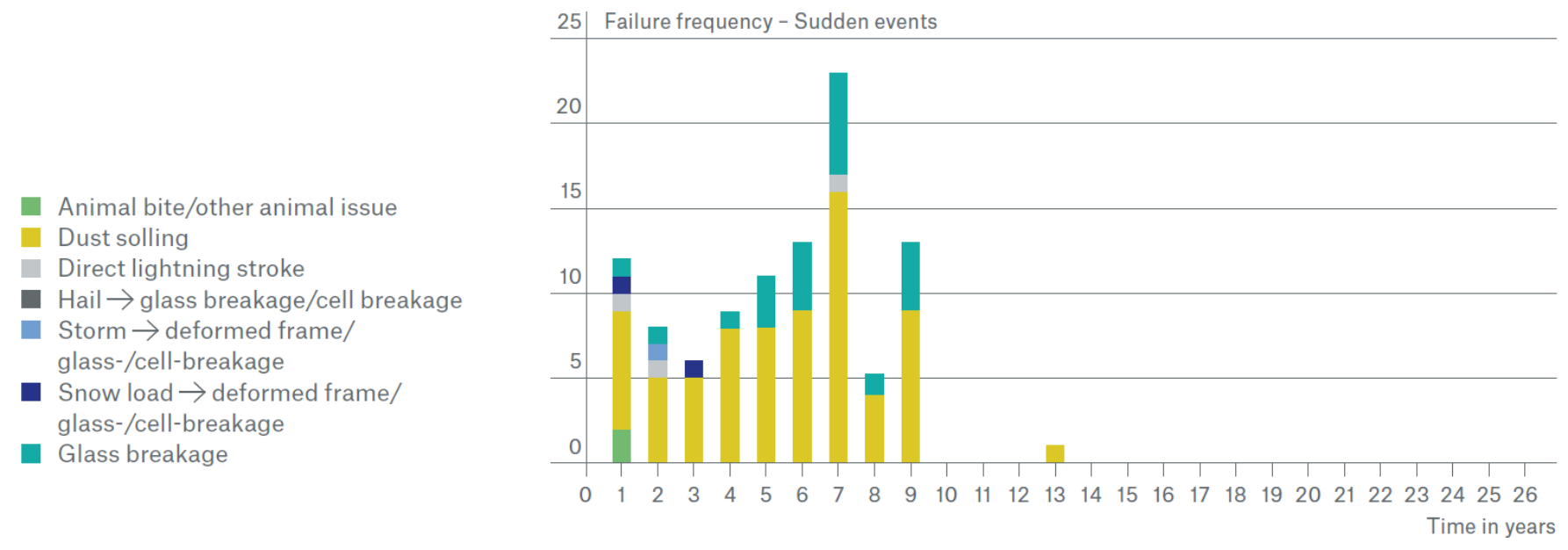
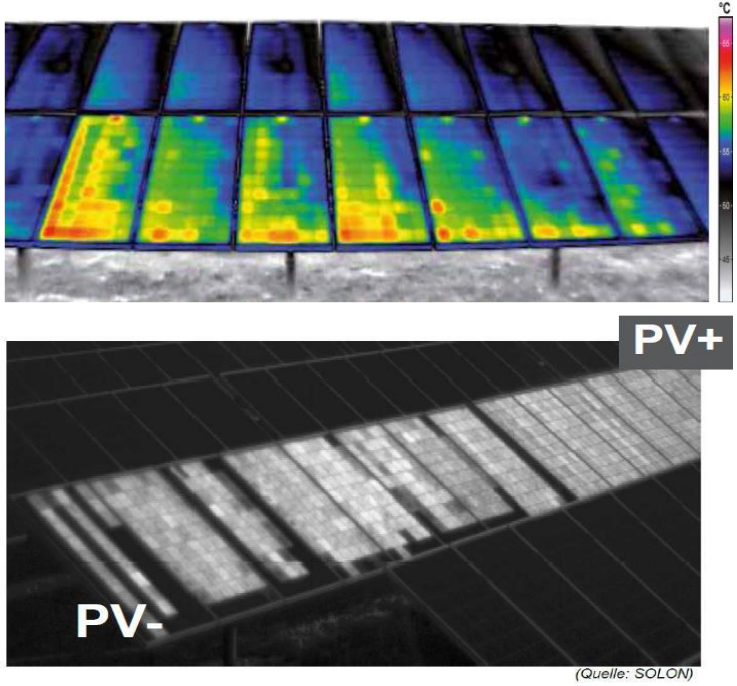
Frequency of PV module failures affecting system performance



Potential Induced Degradation (PID) – Detection methods in the field

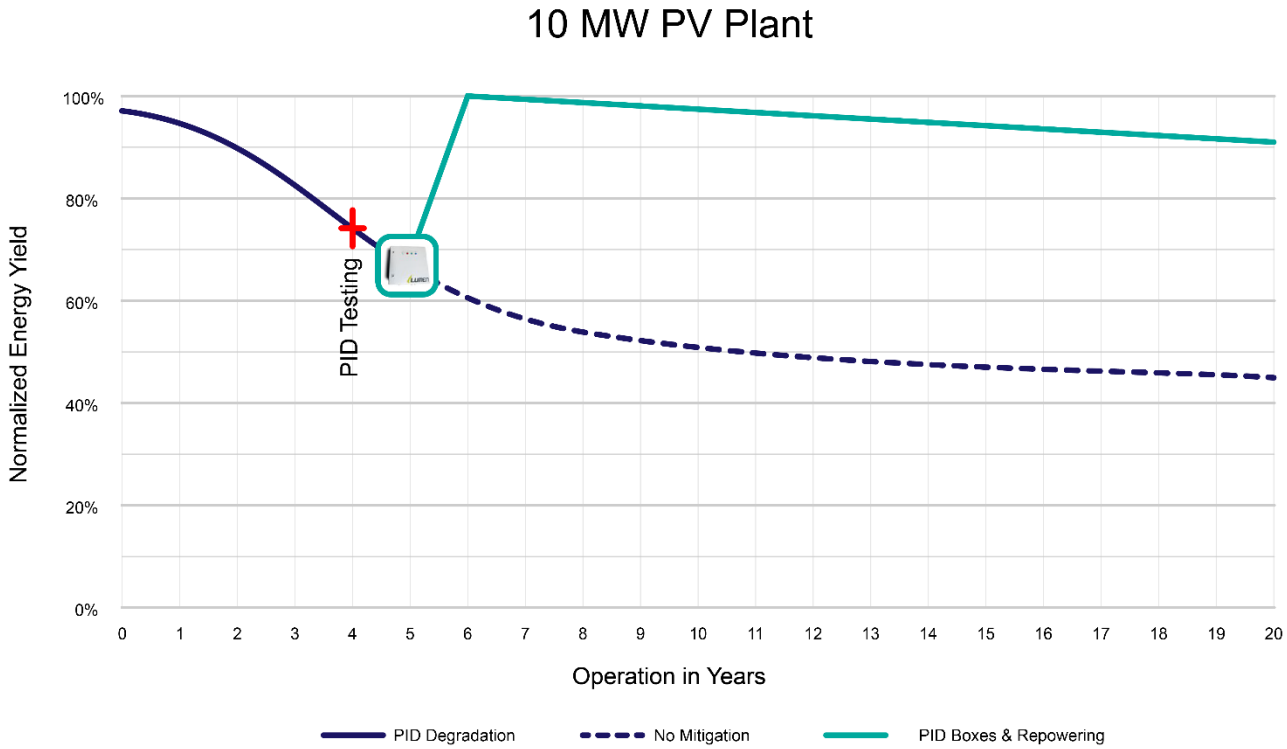


Drone-mounted
IR & EL imaging of
PV modules & arrays

Outdoor PL imaging
of PV modules

M. Herz, G. Friesen, U. Jahn, M. Köntges, S. Lindig, D. Moser, “Quantification of Technical Risks in PV Power Systems”. Report IEA-PVPS T13-23:2021. ISBN 978-3-907281-11-6.

Case study of PV power plant with PID-affected PV modules



Mitigation measures:
MM1 = PID boxes
MM2= Repowering (30% PV modules)

Calculated energy yield in 20 years:
45% of rated energy output

Takeaways

to reduce technical risks and ensure investor’s return

Independent quality assurance is key in preventing technical risks arising from the enormous cost pressures along the entire PV value chain.

Monitoring, inspection and regular PV module testing during the operational phase are crucial for early detection of underperformance of the PV plant.

In a case study of a real risk event, underperforming PV modules were identified at an early stage and corrective measures were taken to avoid financial loss of revenue.

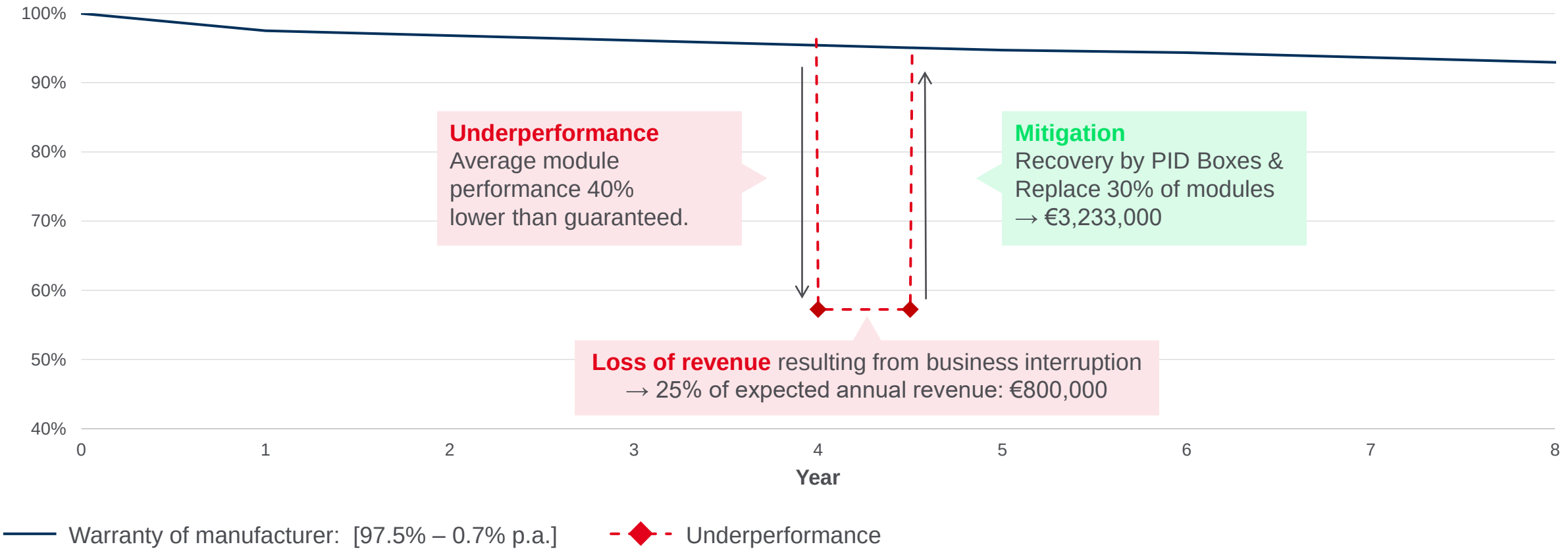
The economic impact of technical risks on PV project business models can be quantified not only to determine the impact of failure, but also to assess the effectiveness of mitigation measures.

Case Study: 10 MW Solar Park with PID-affected modules

The park suffers from losses without an active PV module warranty

10 MWp Solar Park with PID-affected Modules

Percentage or Nominal Power



Case Study: What is the loss covered under the warranty?

The real claims costs are covered under the maximum loss payout

Maximum eligible loss amount

Depreciated value of all defective modules

Park value		Defective modules		Depreciation		
€16m	×	30%	×	(1 – 4 years × 4%)	=	€4,032,000

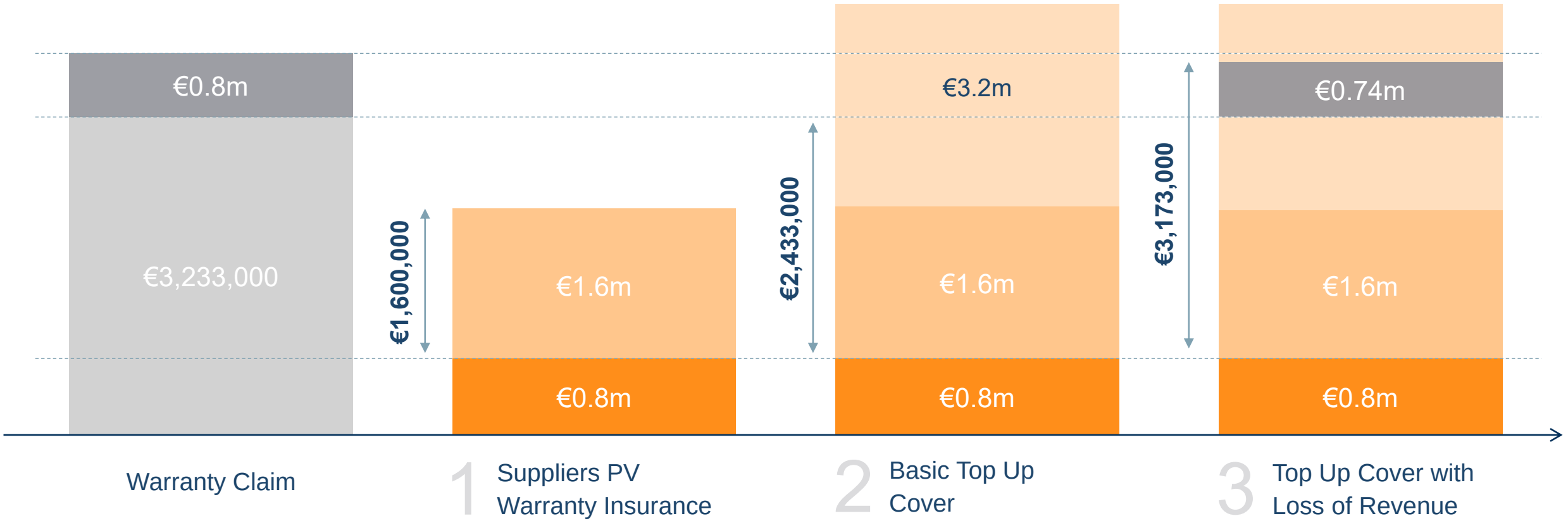
Costs of purchasing additional modules to compensate under-performance

Guaranteed Wp in Year 4		Underperformance below warranty		Market price per Wp in Year 4		
9.54 MWp	×	40%	×	€0.97	=	€3,701,520

Mitigation measure costs of **€3,233,000** are covered under the maximum warranty payout of **€3,701,520**.

Case Study: What is the benefit of an insurance solution?

Different insurance structures support the solar park in risk mitigation



Takeaways

Long-term investment with high quality suppliers and risk transfer

Munich RE

Insurance provides a benefit for project developers and investors as it reduces the risk substantially as shown in the case study

We recommend to check our PV Warranty Partner List to chose a high-quality module manufacturer

Ask your manufacturer for a PV Warranty Insurance including

1

Insurance limit >5% of the module value

2

Insurance limit for 25/30 years (not decreasing and non-cancellable)

3

Insolvency trigger to protect project owner

4

Reinsurance has financial rating of at least AA- by S&P

Let’s get in touch!

Please contact us via E-Mail or LinkedIn.

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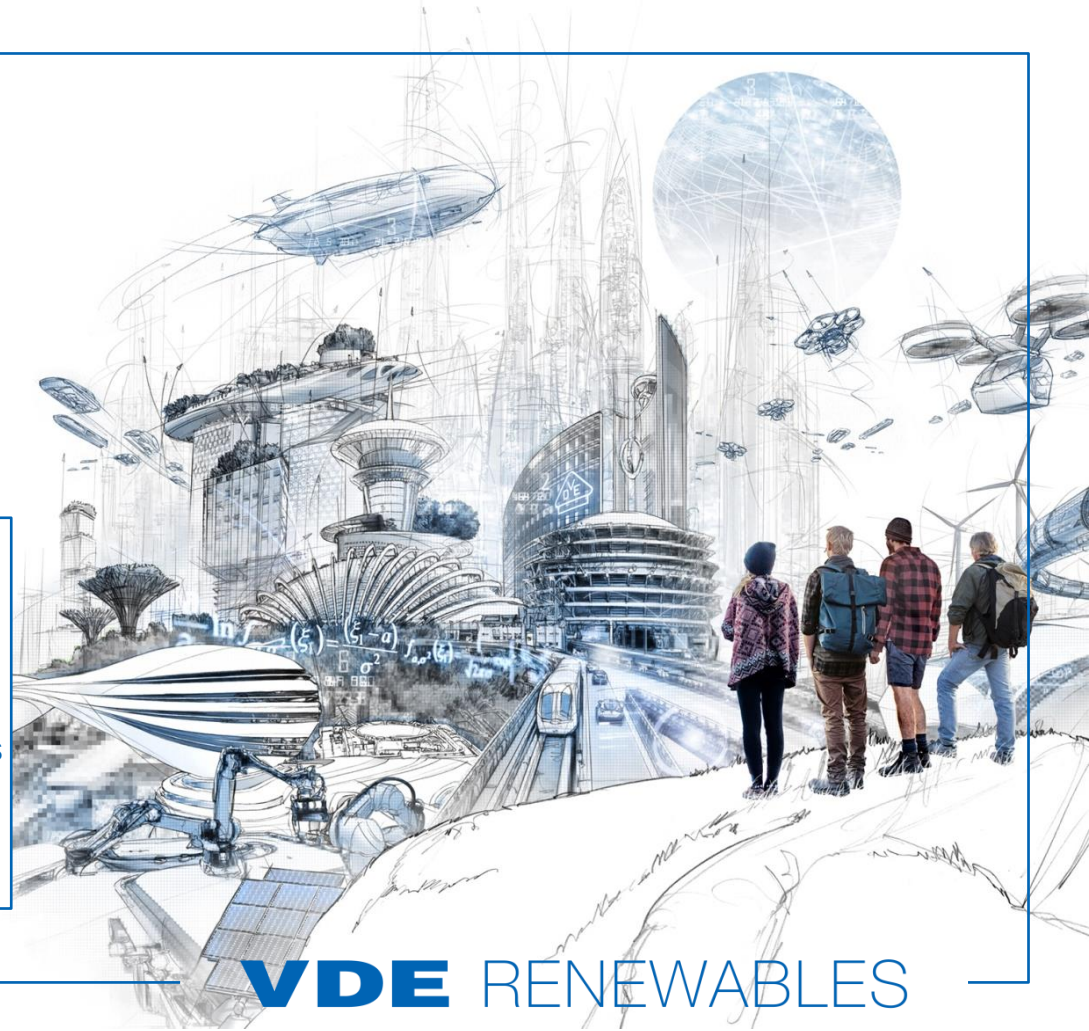
Image: the_burtons / Getty Images

Thank You
for Your Attention!



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