TRAINING ACTIVITIES

Objectives

With solar expected to become the world's primary electricity source by 2030, the Solar Quality Summit 2025 brought together industry leaders to spotlight the critical role of high-quality manufacturing and advanced operation and maintenance (O&M) practices. The summit emphasized that cost-effective solar energy must not come at the expense of quality and long-term performance. The objective of the attendance to this event was to obtain information about the state-of-art of PV O&M in the industry.

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Results

Solar's Rise and the New Value of O&M

- Financial relevance of solar: a multi-billion-dollar business.
- Quality as essential for de-risking investments and increasing returns.
- Need for robust quality assurance (QA) systems to lower LCOE, improve module lifespan, and manage system complexity.

Quality vs. Price: A Strategic Choice

- Information flow across the PV value chain is fractured. Module buyers often lack insight into why a product was selected or how it was tested.
- Quality assurance is often claimed but rarely implemented in practice.
- Low prices (e.g., < €2/kW/year for O&M) are below sustainable levels and risk compromising long-term performance.

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AI, Digital Twins and Data Sharing

- AI is bridging the gap in field workforce shortages, with applications in defect detection, pattern recognition, and maintenance prioritization.
- Digital twins and real-time monitoring platforms allow better asset understanding and performance forecasting.
- Challenges include trust in AI output, workforce capacity, data quality, and integration across fragmented systems.
- Data spaces help maintain data sovereignty while enabling secure collaboration.
- Challenges include NDAs, unstructured internal data, and lack of incentives for data sharing.
- Opportunities: More predictive maintenance, system optimization, and transparency if challenges are addressed.

O&M Best Practice guidelines

- A new chapter includes case studies on EL inspections after hail damage, showing that 80% of panels suffered damage, ranging from minor cracks to severe structural damage.
- Electrical safety is not yet a well-established topic in O&M, which is why a specific section has been included in the document.

BESS deployment

- Thermal management & BMS are critical for safety and performance, especially with high-density batteries.
- Standardization & Certification: Knowing your supplier and their compliance status is key.
- Policy gaps (like Portugal's lack of storage safety licenses) slow integration.

Standards and certification

- Over 200 IEC standards exist for PV, but gaps remain, especially around long-term degradation, junction box failures, and tracker/battery integration.
- Certification often involves ideal "golden modules," which may not reflect field-deployed products.
- There's a growing call for rating systems instead of binary pass/fail standards, allowing buyers to better assess product durability.
- There is a need for manufacturers to be involved in standardization committees, and it is also important to include users. Sometimes there is too much R&D.

Recycling

- Reuse & Circularity: Business models are emerging, but legal frameworks and certification standards are still developing.
- Some RI are pushing for a "safe and sustainable by design" (SSBD) approach to reusability scoring.
- Without clear regulations, shipments risk being labeled as "waste" under the Basel Convention. New standards (e.g., IEC TR 63525) are on the way.

Training Activity	Attendance to SolarQualitySummit.
Date	18 & 19 February 2025
Number of attendees	2
Place and country	Spain (Barcelona)
Consortium Partners involved	EURAC, TECNALIA
Additional Notes	none

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