

“Scaling-up solar PV deployment: implementing projects with assured quality”

**Deep Dive Workshop (DDW) co-organised by IRENA and the Asian Development Bank
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Key take aways

- We entered a PV technology era of low equipment cost and higher pressure on marginal profits. Therefore, quality infrastructure is critical to mitigate risks and achieve the expected LCOE
- The benefits of implementing a quality infrastructure for PV systems outweigh its cost
- Quality is not about hardware only, but a system approach is needed, including quality in design, installation, operation, maintenance and decommissioning of PV systems.
- There is a need to engage emerging PV markets and work closer with project developers and R&D bodies to adapt technology and technical requirements to different climate conditions
- International and regional cooperation networks strengthen and accelerate the development and implementation of QI for PV systems. Leverage on existing initiatives
- QI supports effectiveness of policies for PV markets – all white papers should include the role of QI
- QI is a key instrument to ensure a resilient energy sector for communities around the globe

Summary Notes from Presentations

- The Asian Development Bank has established in its 2030 strategy a stronger support to clean decentralized system, promotion of solar energy, mini grids and energy transmission. By this, to strengthen the alignment with their development strategies, the bank is making a priority in their agenda the development and implementation of quality infrastructure (QI) in clean energy.
- India was presented as one of the successful cases of QI in policy. In 2017, the country had developed direct current standards for the different energy access TIERS, to promote the electrification of all villages in India. As of today, these standards have been embedded in government projects.
- In the case of a supplier default or presence of severe risks (e.g: natural hazards, equipment underperformance), a supplier warranty is not sufficient to back up the project bankability. A reliable insurance of the supplier's

warranty could respond to these situations and safeguard the plant operations. Also, it was suggested to complement this with other methods that can help to reduce risks and diminish any loss of revenue, such as: certifications, bill of materials evaluation, factory inspections and extended reliability tests.

- Speakers from the industry gave recommendations in how to consolidate a high internal rate of return based on good quality practices, these are: (i) Utilize as a reference the top performers reliability scorecard reports (ii) Get well informed about the BOM, this can minimize module failures (iii) Perform calculations about the high outdoor actual performance (iv) Search for +3% power tolerance and excellent temp coefficient.
- To ensure the stable operation of a PV project within its entire lifecycle, the China General Certification Center suggested to use manage and control quality through the whole process, including product certification, manufacturing supervision, resource evaluation, design evaluation, commissioning test, monitoring, O&M evaluation.
- In 2017, CGC was entitled to operate as a Certification Body and Inspection Body under IECRE.¹ By this time, CGC is able to issue project design certificates, conditional project certificates, final project certificates, project O&M certificates.
- Together with reliability and durability of PV projects, a crucial aspect is resiliency. The quality narrative should change to include and adapt to this concept, and Solar PV projects should be designed and planned to be resilient, able to survive large-scale and complex disruption.
- A study presented by TUV Rheinland showed that comprehensive quality assurance for PV modules is required for appropriate cabling design and installation. Also technical due diligence and PV Power plant certification was several times emphasized to mitigate risks and assure projects bankability.
- The IRENA platform INSPIRE was showcased. It was explained to the audience how to utilize this resource to perform analysis of technical standards. Also, it was stressed the importance on the involvement of Asian countries in Technical Committees.
- The PV Module Reliability Scorecard 2018 was presented; introducing PV modules product qualification. The results related to damp heat, PID performance and witness test were displayed and summarized. The top performers were module types that degraded less than 2% for the entirety of the test sequence.

¹ IECRE's goal is to ensure a uniform: (i) implementation and mutual recognition between certification bodies and test labs, (ii) implementation and delivery of information by suppliers, sub-suppliers, end users and others providing documentation for certification, and (iii) implementation and clear understanding of all suppliers, sub-suppliers, end users and other applicants for the elements and modules as well as reports, statements and certificates of the certification processes.

- Certain challenges were highlighted in the Q&A segment, some were: lack of testing infrastructure, disconnection between policy and QI, gap of qualified and trained human resource, limited involvement of stakeholders and need of capacity building to technicians.
- In the session *Ask the Expert*, speakers recommended certain mechanisms to assure quality in Solar PV projects, some are: onsite testing for the PV module manufacturer, BOM evaluation, pre shipping inspections and certification of PV plants.