

### SOLAR ENERGY

## Mitigating photovoltaic investment risks

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As solar photovoltaic (PV) profitability grows and long-term successful solar farms continue to demonstrate the viability of the technology as a business venture, financial risk assessments of solar PV investments increasingly include technical risks that limit the yield of the installation, such as downtime related to technical failure. To aid in such assessments, Ulrike Jahn from TÜV Rheinland Energy in Germany and colleagues from Italy and Belgium develop a methodology to assess the financial costs of technical risks in solar PV projects and estimate the potential savings from implementing risk mitigation measures.

Working with data from more than 700 solar PV plants, the researchers identified and categorized the different technical reasons for failures in solar PV operations. The related costs for each type of failure were estimated including the cost of plant downtime. Three types of mitigation measures were identified—reducing the number of failures, the time to failure detection and the time to repair. Costs were then estimated for eight specific mitigation measures, from component testing of PV modules to spare-part management. High, medium and low risk scenarios were considered. The authors found that implementing the mitigation measures can bring savings of up to €91.1 per kiloWatt (peak), depending on the failure scenario. These cost estimates can provide significant information for effective financial planning and assessment of returns, for solar PV investors as well as for other stakeholders.

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