Abstract:
The presented paper reports the results of the experimental work performed at European Solar Test Installation (ESTI), using an array of 70 polycrystalline silicon photovoltaic (PV) modules by the same manufacturer. After almost 20 years of continuous outdoor exposure, the modules were subjected to a comprehensive indoor test plan; in particular, electrical performance measurements were performed, together with a detailed visual analysis. It was also possible to perform a comparison between final and initial data (in particular IV characteristics): module average performance decay is 4.42% for the whole period. Degradation mechanisms, together with their effect on module lifetime, were also analyzed. Results of such a measurement exercise clearly show how photovoltaic device reliability over decades can guarantee safe investments, for the benefit of all PV users and stakeholders. The authors are currently installing the modules for further 20 years of outdoor exposure.

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Publication Year:
2013

Type:
Articles in Journals

Science Areas:
Energy and transport [2]

Keywords:
efficiency [3]
renewable [4]
solar [5]
sustainability [6]