

LOAD EVALUATION OF PV-MODULES FOR OUTDOOR WEATHERING UNDER EXTREME CLIMATIC CONDITIONS

Michael Koehl, Claudio Ferrara, Markus Heck

Fraunhofer ISE, Heidenhofstr. 2, 79110 Freiburg, Germany

Abstract

Manufacturers usually give a warranty for at least 20 years although there is still only little knowledge about the lifetime of newly developed modules. How do they cope with snow, salty ambience, desert-climate or tropical humidity? The Fraunhofer-Institute for Solar Energy Systems and TUV Rheinland have installed different outdoor exposure sites where modules have to stand extreme climates: high temperatures with high differences between day and night in the Negev desert at Israel, snow, wind and extreme UV-irradiation and frost in the German Alps, high humidity at warm temperatures at Indonesia.

UV-irradiation, solar-irradiation, ambient- and module-temperature, ambient humidity and wind speed is measured and collected at a central server in Germany. Results of the first 24 months of exposure are compared. These data are the base for the calculation of integral loads for the comparison of different climatic regions and for the development of test procedures suitable for the estimation of the service life. The load differences for the different sites and the resulting test conditions for PV-modules will be discussed.