

RESULTS IN PERFORMANCE IMPROVEMENT AND OPERATIONAL OPTIMIZATION OF PHOTOVOLTAIC COMPONENTS AND SYSTEMS

Laurentiu FARA,^{1,2} Alexandru DIACONU,¹ Dan CRĂCIUNESCU¹

Abstract. *New trends in advanced solar cells technologies regarding the conversion efficiency increasing and cost drop are analysed. In order to overcome the conversion efficiency Shockley-Queisser limitations new types of solar cells were developed (based on the third and fourth generations). A global vision in modeling and simulation of advanced solar cells was considered.*

High opportunities in PV modules and systems are based on new adhesive solutions for PV modules, development of PV ribbon products and spectral corrections for PV performance modelling, reliable solar radiation database and progressive integration of PV systems in electricity market.

Modelling and simulation of photovoltaic systems represent an essential task for their integration in current power applications. A comprehensive analysis of the most interesting software packages used for simulation of a Photovoltaic Park is achieved and commented for future development.

Keywords: Trends, challenges, opportunities, advanced solar cells, modelling and simulation, PV system, PV Park, simulation, modelling, software tools.

¹University "Politehnica" of Bucharest (Romania).

²Academy of Romanian Scientists, Bucharest (Romania).