

FORECASTING OF ENERGY PRODUCTION AND OPERATIONAL OPTIMIZATION FOR PHOTOVOLTAIC SYSTEMS

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Rezumat. *In order to forecast the solar radiation, two statistical models, namely Artificial Neural Network (ANN) and Autoregressive Integrated Moving Average (ARIMA), were analyzed. Considering these methods, an estimation of energy production for BIPV systems and PV parks as well was developed. The results obtained by ANN and ARIMA models for the analyzed case studies were compared between them. We analyzed the fluctuations of daily solar irradiation and defined a few synoptic situations to include the cloudiness changes. In this way it is possible to improve the forecasting quality. The solar radiation forecasting based on the two statistical models could be applied with good results on short term and long term as well. Based on complete data sets that include meteorological parameters, such as: 1) air temperature 2) cloudiness, 3) atmospheric pressure, 4) relative humidity and 5) sunshine duration as input data, we minimized the forecasting errors and achieved a more accurate estimation of the power output for the studied PV park.*

Taking into account this approach regarding the forecasting of the PV systems, we could introduce a short analysis of the PV market development using the worldwide PV market performances and features for 2014. The European PV market pointing on its prospects and forecasts until 2019 was characterized.

Keywords: forecasting, solar radiation, statistical models, variability index, energy production, BIPV system, PV Park, PV market

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