ACADEMIC INN INTERNATIONAL

ISSN NO : 2523-1189

Journal of AGRICULTURAL AND RURAL RESEARCH

open access

MODELING OF POWER GENERATION FOR A SOLAR POWER GENERATOR SYSTEM

Engr. Akinrinade N. A.[1], Prof. Onawumi A. S.[1], Prof. Ajayeoba A.O. [1], Dr. Sangotayo E.O. [1*] Dr. Itabiyi O. E[1]., Engr. Olojede, M.A.[1] and Engr. Sanyaolu O. O.[2]

To cite the article: *Engr. Akinrinade N. A.[1], Prof. Onawumi A. S.[1], Prof. Ajayeoba A.O. [1], Dr. Sangotayo E.O. [1*] Dr. Itabiyi O. E[1]., Engr. Olojede, M.A.[1] and Engr. Sanyaolu O. O.[2](2023),* Modeling of power generation for a solar power generator system**,** *Journal of Agricultural and Rural Research*,7(1): 17-29.

Link to this article:
http://aiipub.com/journals/jarr-230826-10076/

Article QR

Journal QR

MODELING OF POWER GENERATION FOR A SOLAR POWER GENERATOR SYSTEM

Engr. Akinrinade N. A.[1], Prof. Onawumi A. S.[1], Prof. Ajayeoba A.O. [1], Dr. Sangotayo E.O. [1*] Dr. Itabiyi O. E[1]., Engr. Olojede, M.A.[1] and Engr. Sanyaolu O. O.[2]

[1]Department of Mechanical Engineering, Ladoke Akintola University of Technology, Ogbomoso, Nigeria.

[2]Department of Mechanical Engineering, Redeemer's University, Ede, Nigeria

[*]Corresponding Author: eosangotayo@lautech.edu.ng

ARTICLE INFO

Article Type: Research
Received: 23, Aug. 2023.
Accepted: 15, Sep. 2023.
Published: 29, Oct. 2023.

Keywords:
Modeling. SAS. Solar, Power, Multiple Regression.

ABSTRACT

Solar power systems have evolved into a viable source of sustainable energy over the years and one of the key difficulties confronting researchers in the installation and operation of solar power generating systems is how to create a model for household power forecasting.

Multiple regression models were developed from experimental data to estimate rotational and static power as a function of time, current, and voltage, using Minitab 20.4 software. The model correlations were assessed using statistical metrics, Mean Absolute Bias Error (MABE), and Root Mean Square Error (RMSE).

The results showed that the rotational and static power models were built using the mathematical model as a function of time, current, and voltage, The coefficient of determination, R^2 for rotational and static power models were 99.64 % and 99.86 % respectively. MABE and RMSE for rotational model were 1.3030 and 0.7431 and MABE and RMSE for static power model were 1.3548 and 0.79405.

Statistical indicators revealed that regression models accurately predicted rotational and static power as a function of time, current, and voltage. The projected values of rotational and static power demonstrate that these quantities can be utilized to predict and compensate for energy deficit.