Environmental Engineering and Management Journal xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx
http://www.eemj.icpm.tuiasi.ro/; http://www.eemj.eu

"Gheorghe Asachi" Technical University of Iasi, Romania

IDENTIFYING OPTIMAL ORIENTATION OF A PHOTOVOLTAIC GENERATOR FOR OZONE WATER TREATMENT

Mohammed Nadjib Brahami[1*], Fatima Zohra Boudjella[1], Said Nemmich[2], Amar Tilmatine[2], Samir Hadjeri[1], Mostefa Brahami[1]

[1]Intelligent Control and Electrical Power Systems, ICEPS, Djillali Liabes University of Sidi Bel Abbès, Algeria
[2]Applications of Plasma, Electrostatics and Electromagnetic Compatibility, APELEC, Djillali Liabes University of Sidi Bel Abbès, Algeria

Abstract

Water treatment has been extensively studied; however, only a few studies have considered it in isolated sites that do not have electric supply, which is a major inconvenience for inhabitants of rural areas. In this paper, the aim was to develop and implement a photovoltaic generator (PVG) that powers a pumping system, and water treatment with ozone. First, the PVG panel's orientation was optimized using response surface modelling to identify the optimum operating orientation angles. Then, this configuration was applied to supply a water treatment system to bleach dye-contaminated water and disinfect well water. The experimental results are presented and discussed to show that our system can be used to treat well water in isolated sites.

Key words: optimization, orientation of the panels; photovoltaic energy; pumping system; zone water treatment

Received: December, 2019; Revised final: May, 2020; Accepted: June, 2020

[*] Author to whom all correspondence should be addressed: e-mail: nadjbrahami@gmail.com; Phone: +213 (0) 541543574