Guest Editorial Preface

Special Issue on Recent Trends in Green Energy Technologies

Mariyam Ouaissa, Moulay Ismail University, Meknes, Morocco
Sarah El Himer, Sidi Mohammed ben Abdellah University, Fez, Morocco
Mariya Ouaissa, Moulay Ismail University, Meknes, Morocco
Zakaria Boulouard, Hassan II University, Casablanca, Morocco

Energy is considered to be a very important ingredient in all human activities such as health, food production, education, industrial production and transportation. Modern energy services are a powerful engine of economic and social development, and no country has succeeded in developing well beyond a subsistence economy without ensuring at least minimal access to energy services for a large part of its population.

Clean energy, or green energy, is a primary energy source that produces a relatively small amount of pollutants when transformed into final energy and then used as such. Green energy is obtained from energy sources that do not impact your health, pollute the environment and do not represent a burden on the environment. For this reason, green energy is the technology that guarantee a clean and healthy environment for the future generations.

This special issue provides an overview on the most recent trends and discoveries related to green energy technologies, as well as strategies and approaches combining experimental, theoretical and analytical applications. It will be a collection of original contributions related to green energy, Sustainable Development, Environmental Sustainability, Sustainable Industrial Technology and Computing.

This special issue is a collection of four papers which are written by eminent professors and researchers from different countries. The papers were initially peer reviewed by the Editorial board members and then, by reviewers who, themselves, span over many countries.

In the paper "Optimal Placement of Distribution Generator in Micro-Grid for Loss Minimization Using PSO," authors aims to obtain the best DG units sizes and locations to have the efficient operation of the distribution network. The capacity of DG and its location are the two constraints. Particle Swarm Optimization (PSO) is used to acquire the optimum DG unit in the radial network for the upgrading of bus voltage and reduction of power loss in the system. The proposed technique was validated on the IEEE-10 bus and IEEE-13 bus standard radial test systems and the obtained results show that the voltage profile is improved as well as loss is reduced in both test systems. A comparison result is also presented between the proposed and reported techniques in the literature. The results prove that the proposed method is effective for the optimal placement of DG units in the micro grid.

In the paper "Technical-Economic Feasibility Study of a Tri-Generation System in an Isolated Tropical Island," the authors analyzed a Tri-generation System in a large scale out of grid and elaborated a technical-economic feasibility. The case study is based on an isolated tropical island. For

the baseline scenario, two traditional energy production systems that do not contain energy recovery in the engines are assumed to be implemented. For the improved scenario, a Tri-generation System absorption chiller is analyzed. An economic analysis of this project was given, the indicators obtained, it was possible to conclude that the use of a Tri-generation System on an isolated large scale out of grid energy consumption system, is feasible and preferable.

The paper "Prediction of Photovoltaic Panels Output Performance Using Artificial Neural Network" develops an accurate model of a PV module in order to predict its electrical characteristics. For this purpose, an artificial neural network (ANN) based on the backpropagation algorithm is proposed for the performance prediction of a photovoltaic module. In this modeling approach, the temperature and illumination are taken as inputs and the current of the mathematical model as output for the learning of the ANN-PV-Panel. Simulation results showing the performance of the ANN model in obtaining the electrical properties of the chosen PV panel, including I–V curves and P–V curves, in comparison with the mathematical model performance are presented and discussed. The given results show that the error of the maximum power is very small while the current error is about 10-8, which means that the obtained model is able to predict accurately the outputs of the PV panel.

In the paper "A New Reduced Form for Real-Time Identification of PV Panels Operating Under Arbitrary Conditions," the authors present an efficient solution based on the reducing forms approach, to extract the five parameters of the single-diode model of PV generators from their I-V curves. Thus, by reducing the number of the five unknown parameters to two unknowns, the analytical expression of the current based on the LambertW function will then depend only on the ideality factor and the series resistance, as the two unknowns to predict numerically using the non-linear least square technique. The three other parameters are calculated as functions of the two predicted parameters using a linear system of three equations. Two sets of experiments are used for the validation of the proposed approach, which first showed its rapidity and high accuracy compared to the best approaches from the literature. Then, the method was applied for the real-time identification of four PV modules operating outdoors during one reference day at Cocoa (Florida).

Mariyam Ouaissa
Sarah El Himer
Mariya Ouaissa
Zakaria Boulouard
Guest Editors
IJEOE