

## Modeling and simulation in the energy sector

The University of Bahrain organized the 8th International Conference on Modeling, Simulation and Applied Optimization (ICMSAO'2019). The ICMSAO'2019 aims to bring together researchers and practitioners from all over the world to share and discuss advances and developments in the fields of modeling, simulation and applied optimization and their applications.

Modeling and simulation in the energy sector is one of the most active areas in the field of energy management. The integration of mathematical models and simulation have led to a sustainable management of energy resources. This integration allowed us to better forecast the needs, reduce the costs and improve energy prices. Also, it offers an opportunity to understand the impact of our decisions before we act. Nowadays, the challenges of energy management researchers are facing are sustaining the global economy development and protecting health and environment.

This Special Issue on modeling and simulation in the energy sector includes seven papers where a few of them were presented in ICMSAO 2019. The main purpose of the special issue is to focus on models to solve real life problems.

The paper, entitled "Energy load forecasting: Bayesian and exponential smoothing hybrid methodology", proposes a new hybrid approach to predict long-term electricity peak load based on additive model and Bayesian regression model. The model efficiency was demonstrated through monthly load data from the Kingdom of Bahrain.

The second paper, entitled "Where are fossil fuels prices heading?", aims to forecast the price of fossil fuels in 2030 using spectral analysis.

The third paper, entitled "Optimum Management of Manual Sectionalizers in Electric Power Distribution Networks Integrating Distributed Generations using Binary Exchange Market algorithm", proposes a multiple objective model to determine the location of sectionalizers in the presence of distributed generations with binary exchange market algorithm.

The fourth paper, entitled "A statistical approach to identify asynchronous extreme events for Multi-regional Energy System Models", uses statistical models to analyze the tail of the residual demand distributions to avoid misleading investment in conventional and low-efficiency generators.

The fifth paper, entitled "Forecasting the wind direction by using time series models with long-term memory", designs a model to determine wind direction and wind turbines position that allows producing maximum energy.

The sixth paper, entitled "Multi-component modeling and classification for failure propagation of an offshore wind turbine", proposes a degradation model in different components of a wind turbine and classifies these components according to their causes of failure.

The seventh paper, entitled "Influence of temperature and irradiance on the different solar PV panel technologies", reports on a real case study from Tunisia where authors explore the location for photovoltaic systems taking into account the most influencing factor for such a decision.

We take this opportunity to thank the authors, who have contributed to this special issue, for their efforts to submit high quality papers, and the international referees for their relevant comments and suggestions that improved rigor of the research papers.

**Hatem Masri and M.R. Qader**  
*University of Bahrain, Manama, Bahrain*

