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## Editorial

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**Biographical notes:** Haris Doukas is a Mechanical Engineer with a PhD on Decision Support Systems (DSS) for the promotion of renewable energy sources (RES) and energy efficiency (ENEF) in the energy sector. He is currently working as a Senior Expert of the DSS Laboratory, School of Electrical and Computer Engineering of NTUA and has been involved in a number of research and consultancy projects in the fields of modelling, development and administration of DSS for energy policy and planning, promotion of technologies and management. His areas of expertise includes multicriteria models and decision support systems for energy policy, sustainable energy planning in local and regional level, climate change economics and Kyoto GHG emissions reduction flexible mechanisms. His publications record includes 46 scientific publications in international journals, 21 announcements in international conferences and many articles published in magazines, journals and books.

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Aim of this special issue is to provide a constructive forum among researchers for fostering discussion, developing and exchanging new ideas on multicriteria analysis and decision aid in the fields of energy policy and planning towards sustainable development.

In this special issue, five-articles were selected covering generation and demand, as well as the transport sector, and aligning MCDM practices, innovations and case studies for power generation expansion planning problems, high temperature hydrogen production processes, promotion of renewable energy sources and rationale use of energy, through specific MCDM applications for PVs and demand side management (DSM) programmes, as well as alternative fuel/technology options for light-duty vehicles.

The issue opens with the article of M.B. Yildirim et al. presenting a fuzzy multi-objective model for power generation expansion planning (FMGEP) problem with uncertainty in objective functions and demand balance constraints. The purpose of the fuzzy generation expansion model is to determine the optimal generation amount in existing and new generation units and the optimal transmission network, given that decision-maker may tolerate some violation in constraints and objective functions. A fuzzy linear programming approach is utilised to transform the FMGEP model into a linear programme. To illustrate the proposed model, a Mexican Electric Power System case is studied.

A. Papadopoulou et al. present an integrated decision support methodology for the pre-selection of the DSM programmes, using an expert-based system, and their evaluation, using the multicriteria 'linguistic TOPSIS' model. The aim is to assess DSM

contribution to the energy companies' objectives, especially the power generation ones. The application of the method to the Greek energy market and the related sensitivity analysis are presented and discussed, illustrating the methodology's support on energy companies' objectives.

O. Galzim et al. continues with an article presenting a multicriteria approach, based on the ELECTRE I, developed for the evaluation of high temperature hydrogen production processes for massive production of hydrogen with minimal greenhouse gas emissions. The demand for hydrogen has undergone strong growth with the increasing needs of industry, while the hydrogen consumption has doubled over the last 30-years. The overall goal is to guide R&D strategies by highlighting to which extent the processes may appear promising.

P. Siskos and S. Houridis present a study regarding the decision-making problem of a specific investor willing to invest in the development of a small photovoltaic park, in the Greek PV market. The main objective is to structure this specific problem as a multicriteria decision problem, in terms of identifying a set of alternative companies activated in the PV market, formulating a consistent family of criteria and adapting ELECTRE I multicriteria method for the financial and the technical evaluation of the submitted proposals by each company.

The last paper by R. Fazeli et al. presents a multi-criteria evaluation framework for alternative fuel/technology options for light-duty vehicles in a mid-term horizon (over the next 20-years). Such a framework is intended to assist policy makers' decisions concerning the development of infrastructures and the establishment of incentives to promote alternative fuel vehicles. A sequential screening process was applied to identify the preferred alternatives, starting with a Pareto optimal (PO) approach, followed by a data envelopment analysis (DEA) and a trade-off weights (TW) procedure. The framework was applied for the case of Portugal.

Finally, I wish to express my sincere thanks to Professors John Psarras and Constantin Zopounidis, editors-in-chief of *IJMCDM* for having given me the opportunity of editing this special issue as well as to Dr. Panos Xidonas (*IJMCDM* associate editor) for his support and valuable comments. Sincere thanks must be expressed to all the authors whose contributions have been essential in creating this special issue. We also thank those who worked long and hard to review all the submitted papers and contributed to the achievement of this special issue's high standard.

As guest editor of this special issue, I do hope that this special issue will foster further the discussions and exchange experience on MCDM decision support models and methods for assessing critical parameters, alternative practices and policies towards a sustainable energy sector development.