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## Editorial

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**Biographical notes:** Aleksander Zidanšek is a Professor of Physics at the Faculty of Natural Sciences and Mathematics at the University of Maribor, Researcher at 'Jožef Stefan' Institute and the Secretary General of Jožef Stefan International Postgraduate School. He is active in environmental physics, renewable energy sources including space-based applications, condensed matter physics, physics of liquid crystals, nuclear magnetic resonance, small angle X-ray scattering, radar and Terahertz imaging as well as applications in security. He is also an associate member of the Club of Rome and Fellow of the World Academy of Art and Science.

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The global crisis is on one hand a threat to the ability of future generations to meet their needs for a quality life, and on the other hand also an opportunity for new innovative solutions that could significantly improve the quality of our lives in the 21st century.

The 7th Conference on Sustainable Development of Energy, Water and Environment Systems (SDEWES) was held in Ohrid in 2012 at the 25th Anniversary of the Report of the World Commission on Environment and Development 'Our Common Future'. Following the definition from 'Our Common Future' that sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs, the SDEWES conferences have grown into a dynamic interdisciplinary focal point for researchers to meet, originate, discuss, share, and disseminate new ideas and knowledge on sustainability. The Ohrid Conference was dedicated to the improvement and dissemination of knowledge on methods, policies and technologies for increasing the sustainability of development by de-coupling growth from natural resources and replacing them with knowledge based economy, taking into account its economic, environmental and social pillars, as well as methods for assessing and measuring sustainability of development, regarding energy, transport, water, environment and food production systems and their many combinations.

This special issue of contributions presented at the Ohrid Conference is aimed to help researchers and experts from the field of environment and sustainable development with fresh ideas to strengthen the global potential for sustainable development. It has been prepared with the aim to include both the analysis of the current situation as well as ideas

for innovative solutions that could significantly improve the quality of our lives in the 21st century. It includes analysis on the current situation, analysis of some interesting ideas for energy production, energy efficiency improvement and lower energy demand as well as long term predictions on the potential for biomass-based energy carriers in EU-15 countries up to the year 2050.

Manton et al. present a new methodology for calculating the carbon costs and savings associated with cycle route construction in order to creating a balance sheet for the sustainable design and construction of cycling routes. They found that about 100 commuters per year would need to shift to cycling per year in order to offset the carbon footprint of a 10 km asphalt greenway, assuming a 20-year life cycle.

Palander and Hietanen consider a potential fuel procurement planning model for sustainable energy production. They use a case study of the Finnish Government's peat fuel tax policy decisions for sustainable energy production. Although the model is very complex, the authors demonstrate peat and forest fuel relationships which indicate that meeting peat tax targets may not be adequate for the future success of renewable energy production. The most important problem is that energy production costs are increasing and forest fuel procurement targets can not be achieved.

Vázquez et al. evaluate the energy and the carbon stored from tropical Acacias. They present the results of a research project to develop a methodology to estimate the energy content and the carbon sequestered in the above ground biomass of trees in plantations of *Acacia cochliacantha* and *Acacia pennatula*. These are leguminous tree species of the tropical dry forest of Mexico and Central America. The authors transformed allometric equations into energy and carbon sequestered equations, which could be potentially useful in calculating energy content and carbon sequestration in order to enhance the economics and management of this Acacia plantations.

Johansson et al. compare heat integrating a biomass-to-Fischer-Tropsch syncrude process with a refinery to a stand-alone biomass-to-Fischer-Tropsch syncrude process, in terms of the consequences for greenhouse gas emissions and energy balances. Fischer-Tropsch process allows to produce diesel and gasoline from gasification of biomass. The authors find that although among the studied systems the integrated Fischer-Tropsch-syncrude production shows the largest greenhouse gas emission reduction potential, co-firing biomass in coal power plants still has a larger greenhouse gas emission reduction potential.

Bačelić Medić et al. present long-term energy demand projections for Croatian industry sector. Their model predictions are based upon bottom-up approach model which combines and data on various economic and technological parameters. The authors find that the predictions in Croatian National Energy Strategy are outdated due to the economic crisis. There are, however, still significant possibilities for energy efficiency improvements and lower energy demand in the future, based on careful and rational energy planning.

Ajanovic and Haas present an analysis of the economic prospects and potentials of advanced biomass-based energy carriers in EU-15 countries up to the year 2050. Their conclusion is that in the most promising scenario and in absence of a major technological breakthrough, energy carriers based on biomass can provide about 7% of the current total final energy consumption by the year 2050.