



**“Gheorghe Asachi” Technical University of Iasi, Romania**



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## **EDITORIAL**

### **A SPECIAL ISSUE DEDICATED TO**

### **SUSTAINABLE ENERGY**

**THE 3<sup>rd</sup> CONFERENCE ON SUSTAINABLE ENERGY, CSE 2011**

*10 – 12 November 2011, Brasov, Romania*

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Sustainable Energy defines a field that focuses on three main areas: (1) energy efficiency (2) energy saving (3) the use of renewable energy sources. Thus, the concept of sustainable energy has a direct impact on economic growth through the identification of products obtained by processes and technologies that range from less energy-consumer raw materials, to rational energy use and designing products with low energy losses. New alternative solutions to fossil fuels must be concurrent to the development of an intelligent use of energy produced by conventional methods.

Still, for a large market acceptance significant steps have to be done, especially in developing feasible and affordable solutions, with manufacturing, implementing and maintenance costs, comparable with the traditional systems. The direct cost of electricity produced from renewable sources is, in most cases, higher than for fossil fuels, but for future scenarios two factors must be considered: (1) a lower cost of green energy, especially because of the novel concepts and systems resulted from the research laboratories and (2) increasing price of fossil fuels on their exhaustion along with an increase in the environmental taxes.

The last decade faced a wide interest in sustainable energy for environment protection and the implementation of European Directive 20-20-20 increased the interest in the field of the knowledge providers and recipients of the research results. Advanced research has started to offer solutions to these areas, the results being promoted at conferences and capitalized through technology transfer. Worldwide, there are prestigious events that promote sustainable energy, especially in the field of renewable energy

conversion systems, as there are ISES (International Solar Energy Society Congress, whose 2011 edition was held this year in Kassel, Germany), EUPVSEC (annual PV European conference, whose 2011 edition is held in Hamburg, Germany) ESTEC (Solar Thermal Energy Conference, the 2011 edition is held in Marseille, France), Solar Chemistry and Photocatalysis (SPEA with the most recent edition, 2010, held in Prague). These conferences are focused on one group of applications and the holistic approach of energy production aspects (materials, systems), energy supply and environmental impact is less pronounced, giving, thus, individuality to the CSE conference. The interest in developing clean energy for environmental protection is increasing as well, and is materialized through dedicated events organized by academic and research structures in the field.

The **International Conference on Sustainable Energy, CSE 2011**, at its 3<sup>rd</sup> edition represents a scientific event that is dedicated to the promotion and dissemination of R&D results obtained at national and international level in the field of sustainable energy, environmental protection, innovative products, materials and processes. The event is organized every 3 years, since 2005, by *Transilvania* University of Brasov, aiming from the very beginning to gather international researchers, academics, professionals and students, working in the field of sustainable energy and to support scientific dissemination and experience exchange.

The CSE 2011 conference topics (<http://unitbv.ro/CSE/pagini/Topics2011.htm>) fit in the national and international research priorities and

correspond to the *Transilvania* University strategy, which identified “Sustainable Development”, especially “Sustainable Energy”, as the field of major interest for its advanced research. According to this strategy, the research projects, the interdisciplinary doctoral programs, the post-doctoral programs, etc. are formulated to address core and fundamental-applied issues for the development of new materials for energy conversion, high-tech product development and processes that ensure energy efficiency and limiting losses, while reducing pollution and developing remediation processes and performance low cost.

The development of the University R&D Institute, which coagulates research of excellence, being supported by the major infrastructure project “The RTD Institute: High-Tech products for Sustainable Development: PRO-DD” (24 million EUR, from which 60% are structural funds and about 30% are represented by the university contribution). The new location of the RTD Institute of the *Transilvania* University, developed through this project will be ready in March 2012, consisting of 11 laboratory buildings, designed as low energy buildings, testing various energy mixes. Thus, the institute represents an outdoor testing stand and the optimised sustainable energy solutions will represent standard project ready for technology transfer. The project also supports the RTD infrastructure development; more than half of the project financing is dedicated to the enlargement of the RTD instruments (research equipment, green IT hardware and software) supporting the University in developing as leader in the field of renewable energy systems for environmental protection, in the national academic area. Hosting the human resources of the 22 advanced research centres of the university and the Interdisciplinary Doctoral School, the Institute is unique in concept in Romania and in the SE of Europe.

The university approach in the field of sustainable energy was supported by launching, in 2005, the first edition of the Conference for Sustainable Energy. Since 2005, the conference continues to cover all three aspects of sustainable energy and represents a good opportunity to develop partnerships on new project ideas. Supplementary, the 3<sup>rd</sup> edition, CSE 2011 represents a frame for preparing further international events, as it gathers the researchers and professionals in the field of sustainable energy and environmental protection, struggling for involvement in the development of novel, advanced concepts and applications.

Keeping track with the scientific development, the **CSE topics** enlarged during time by including the novel trends and research directions; therefore, the areas addressed now are including, besides solar energy conversion systems, small wind turbines, micro-hydros, also renewable energy systems in the built environment, sustainable environment solutions and sustainable human settlements. Thus, the current edition is addressed mainly to a new trend on promoting new solutions for integrating renewables in the built environment as significant part in developing sustainable communities. This approach requires

interdisciplinary national / international partnerships, whose training / extension is supported by the current edition of CSE and the Workshop events organized together with representatives of the European Sustainable Energy Innovation Alliance, ESEIA and with the Sustainable Energy Systems Technical Committee of the International Federation for the Promotion of Mechanisms and Machine Science, IFToMM. Considering also the needs for a knowledge-based society, a special attention is given to the high level applications of the concepts, models and to the contribution in development integrated virtual prototyping platforms.

With the experience and reputation gained in previous editions, the 3<sup>rd</sup> CSE conference aims at a qualitative increase by publishing papers, after peer review, in an ISI journal. Thus, at the 3<sup>rd</sup> edition, the organizers received 72 papers, and after an international peer-review process, 57 papers were accepted for presentation and publication in “Environmental Engineering and Management Journal”.

The estimated number of participants at CSE 2011 is of 82, from Hungary, Austria, Germany, Mexico, Belgium, Republic of Moldova, Taiwan, Greece, France, Spain and Romania.

The event includes different scientific activities as follows:

**Plenary lectures**, delivered by worldwide recognized personalities, who present substantial synthesis of achievements in the field, formulate the direction of interest for the years ahead and highlight outstanding achievements. Six Plenary speakers will bring their contribution to this event: Prof. Dr. Eng. Istvan FARKAS, Department of Physics and Process Control, Szent István University, member of the European Solar Energy Society, Prof. Dr. Eng. Bernhard PELIKAN, Institute of Water Management, Hydrology and Hydraulic Engineering, University of Natural Resources and Life Sciences, Vienna, and Vice-president European Small Hydro Association, Brigitte HASEWEND, European Sustainable Energy Innovation Alliance and Technical University of Graz, Austria, Prof. Dr. Eng. Ludwig CARDON, University College Ghent, Centre for Polymer and Material Technologies - CPMT, Belgium, Dr. Dan Ilie TEODOREANU, ICPE SA, Head of the Romanian Platform for Photovoltaics, and Prof. Dr. Eng. Ion VISA, CSE chairman.

**Oral presentations** of recent research results; the papers topic aim, particularly to: in- field data and simulation of renewable energy sources potential, design of PV and solar thermal systems: advanced materials for photovoltaics and solar-thermal; tracking systems; terrestrial concentrator systems; solar heating and cooling; solar energy in architecture; solar converters integration in buildings; hybrid systems; low energy buildings; photocatalysis: photocatalysts; advanced oxidation processes; design of small wind turbines and micro-hydros; off-grid and on-grid applications; water and wastewater treatment: materials

and processes; air and soil de-pollution; biomass and waste recycling; wastes as second raw materials; programs, policies and economic aspects for promoting sustainable energy; education and training on renewable energy. Current research in this area combines techniques as modelling - Digital modelling - Virtual Prototyping in the sustainable development concept, thus enabling the simultaneous evaluation of functionality and sustainability of the systems and their impact on the environment.

The **workshop** organized by the Technical Committee (TC) on Sustainable Energy Systems from the International Federation for the Promotion of Mechanisms and Machine Science IFToMM, moderator Prof. dr. eng. Ion VISA, the TC chairman; the workshop focuses on the presentation of recent and future activities and events in the field.

The **workshop** organized together with the European Sustainable Energy Innovation Alliance ESEIA; the workshop agenda focuses on the presentation of recent and future activities in the field - round tables and conferences and on organizing a branch of ESEIA in Romania.

The major scientific events during CSE 2011 will be presented online, in real-time, on the conference web-site <http://www.unitbv.ro/CSE>. The representatives of mass-media will attend the conference Opening Ceremony and the plenary presentations, in order to present the Romanian initiative in the sustainable energy area and, particularly, the scientific character of this event.

**Guest editors:**

*Ion Visa*

*Anca Duta*

*Codruta Jaliu*

*Transilvania University of Brasov, Romania*



**Ion Visa** was born in Campina, Romania, on Sept., 3, 1949. He received his Ph.D. title in the Transilvania University of Brasov, in Mechanical Engineering. He launched, in 1998 the first academic studies on Product and Industrial Design in Romania and, in 2008 he supported the first bachelor program on Renewable Energy Systems Engineering, part of an integrated training line (bachelor, masterate, doctorate) on renewables, running in the Transilvania University of Brasov. His field of interest is on mechanical and mechatronic advanced solutions for increasing the efficiency of renewable energy systems, particularly solar energy and wind energy conversion systems. He is author of over 200 papers published in mainstream journals and international publishing houses, and 8 patents on renewables. Since 2004, he is the Rector of the Transilvania University of Brasov. He is the general manager of the project developing the RTD Institute of the Transilvania University, to be finalized in 2012.



**Anca Duta** was born in Brasov, Romania, on Dec. 8, 1961. She received her Ph.D. title in the Politehnica University of Bucharest in 1998, working in Physical Chemistry – Interface properties. Since 2002 she is full professor and activates in the Product Design, Mechatronics and Environment Department of the Transilvania University of Brasov, and since 2004 she is head of the Department for Projects Management in the University. Starting with 2005, she is head of the Laboratory for Advanced Materials, in the RTD *Centre Renewable Energy Systems and Recycling*. Her main field of interest is novel materials and structures for solar energy conversion (solid state solar cells, solar-thermal coatings, hydrogen technology, photocatalysis). She published over 200 papers, among which 90 in ISI journals.



**Codruta Jaliu** was born in Brasov, Romania, on Febr., 4, 1964. She received the Ph.D. title in the Transilvania University of Brasov, in Industrial Engineering – Industrial Robots. Since 2003, she is full professor and activates in the Product Design, Mechatronics and Environment Department of the Transilvania University of Brasov. Her research interests include mechanical and mechatronic systems design in general, and, particularly, advanced solutions for increasing the efficiency of micro hydropower systems. She is author of over 150 papers published in mainstream journals, international publishing houses or international conference proceedings and of 3 patents.

 **SECOND CALL**  
TRANSILVANIA UNIVERSITY OF BRAŞOV

**CSE**  
CONFERENCE ON SUSTAINABLE ENERGY  
BRASOV, ROMANIA, November, 10-12, 2011

