



ENVIRONMENTAL PROBLEMS and DEVELOPMENT

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# ENVIRONMENTAL PROBLEMS and DEVELOPMENT

**Energy and Environmental Engineering Series  
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Proceedings of the 1st WSEAS International Conference on URBAN  
REHABILITATION AND SUSTAINABILITY (URES'08)

Proceedings of the 1st WSEAS International Conference on CLIMATE  
CHANGES, GLOBAL WARMING, BIOLOGICAL PROBLEMS (CGB '08)

Proceedings of the 1st WSEAS International Conference on NATURAL  
HAZARDS (NAHA'08)

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Maria Magdalena Zamfirache, ROMANIA  
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## **Preface**

This book contains the proceedings of the 1st WSEAS International Conference on URBAN REHABILITATION AND SUSTAINABILITY (URES'08), proceedings of the 1st WSEAS International Conference on CLIMATE CHANGES, GLOBAL WARMING, BIOLOGICAL PROBLEMS (CGB '08), and proceedings of the 1st WSEAS International Conference on NATURAL HAZARDS (NAHA'08) which were held in Bucharest, Romania, November 7-9, 2008. These conferences aim to disseminate the latest research and applications in Environmental Management, Planning Issues, Energy Resources Systems, Healthy Cities, Harmful Algal Blooms and other relevant topics and applications.

The friendliness and openness of the WSEAS conferences, adds to their ability to grow by constantly attracting young researchers. The WSEAS Conferences attract a large number of well-established and leading researchers in various areas of Science and Engineering as you can see from <http://www.wseas.org/reports>. Your feedback encourages the society to go ahead as you can see in <http://www.worldses.org/feedback.htm>

The contents of this Book are also published in the CD-ROM Proceedings of the Conference. Both will be sent to the WSEAS collaborating indices after the conference: [www.worldses.org/indexes](http://www.worldses.org/indexes)

In addition, papers of this book are permanently available to all the scientific community via the WSEAS E-Library.

Expanded and enhanced versions of papers published in this conference proceedings are also going to be considered for possible publication in one of the WSEAS journals that participate in the major International Scientific Indices (Elsevier, Scopus, EI, ACM, Compendex, INSPEC, CSA .... see: [www.worldses.org/indexes](http://www.worldses.org/indexes)) these papers must be of high-quality (break-through work) and a new round of a very strict review will follow. (No additional fee will be required for the publication of the extended version in a journal). WSEAS has also collaboration with several other international publishers and all these excellent papers of this volume could be further improved, could be extended and could be enhanced for possible additional evaluation in one of the editions of these international publishers.

Finally, we cordially thank all the people of WSEAS for their efforts to maintain the high scientific level of conferences, proceedings and journals.

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## Plenary Lecture I

### Simulation of Consumption in District Heating Systems



**Professor Daniela Popescu**  
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Technical University “Gheorghe Asachi” Iasi, Romania  
ROMANIA

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**Abstract:** The district heating companies from Europe had an annual turnover (2005) of 19.5 billion Euro and supplies heat to more than 100 million people. District heating contributes to higher energy efficiency, greater security of supply and lower carbon dioxide emissions. There is a need to strengthen the competitiveness of this technology.

Important differences between Eastern and Western DHS exist not only regarding the level of modern equipment, but also in the conception of design and operating.

In most Western European countries, the entire district heating system is demand driven, using control equipment at four independent levels: two at the customer and two managed by the district heating operator. Each building usually has separately regulated systems for supplying heat to the radiators (space heating), to the domestic hot water system and to the ventilation system. The main advantage of this concept is that customers establish the space heat demands by means of thermostatic valves, at the first level of the heat demand control, without the risk that the District Heating Company delivers more or less heat than necessary.

In most Eastern European countries, the mentality is different: the District Heating Company evaluates the quantity of heat for each building and delivers it through a distribution network to substations. A number of 20-30 buildings, usually blocks of flats, are connected to the substation and must share the quantity of heat delivered. Only few consumers can adjust the quantity of consumed heat, using thermostatic valves, and the others are forced to receive the rest.

One major area of energy savings and the resulting financial expenditure is the ability to predict the heat consumption in order to match the energy supply. Some methods for simulation and prognosis with a special approach for production driven systems are presented in this study. The influence of input parameters proposed to be taking into consideration for the simulation of heat demand of buildings connected to a district heating system is analyzed. The differences between software for prognosis of heat demand appropriate for production driven systems and software appropriate for demand driven systems are pointed out.

**Brief Biography of the Speaker:** Daniela Popescu is Professor at Fluid Mechanics, Fluid Machines and Drives Department, Technical University “Gheorghe Asachi” Iasi, Romania. She has 18 years of teaching experience in Fluid Mechanics, Fluid Machines, District Heating Systems, Pipeline Systems, Hydroelectric Plants.

Her research interests include district heating systems, fluid mechanics, hydraulic installations, pipeline networks,

aerodynamics and hydrodynamics of turbomachines, experimental technologies for research in hydraulic machines area, design and optimisation of ventilators, hydraulic power plants. She is the manager of the Romanian team in an European research contract and the coordinator of two national complex multidisciplinary research projects.

She published 5 books as author and more than 75 papers as main author or co-author.

## Plenary Lecture II

### Thermal Rehabilitation of Multi-Flats Buildings



**Professor Gheorghe Bacanu**  
Transilvania University of Brasov,  
ROMANIA

Email: [gbacanu@unitbv.ro](mailto:gbacanu@unitbv.ro)

**Co-author:**

**Prof. Sirbu Claudia**

**Abstract:** Rational use of energy in housing is not only a requirement of current building regulation, but a real challenge in the specific case of the apartment blocks built in all the Romanian towns!

The paper presents a few ideas and solutions in the field of thermal rehabilitation of multi-flats buildings. It is underlined the importance of energy management in the optimization of energy utilization. Taking in account the specific (in Romania) situation in the subject of energy losses in buildings the authors propose a solution for the heat losses diminution especially by flat walls.

The paper refers, also, to a general unsuitable situation of the heating system in apartment blocks and proposes a possible technical solution in order to save energy. In this kind of apartments the heating system is a common one, without the possibility to allocate acceptably the heat consumptions for each flat. The individual consumption distribution is made, often, in function of the flats surfaces, which is, evidently, not in accordance with the real consumption.

#### **Brief Biography of the Speaker:**

Engineer License degree obtained in 1974, at Faculty of Energetics, University "Politehnica" of Bucharest;

Master degree in "Gestion de PME-PMI" (SMEs management) obtained in 2001 at Faculte d'Administration et Echange, Universitate Paris XII, Val de Marne, France ;

From 1980 Professor (Department of Termotehnics and Fluids Mechanics), University Transilvania of Brasov (teaching Thermodynamics, Renewable Sources of Energy, Energy Management, Heat and Mass Transfer Processes);

PhD obtained in 1991 with the thesis "Optimization of Heat Pipe Heat Exchangers", (in Romanian); Participations at many International Heat Pipe Conferences and at the last two WSEAS conferences, HTE'07 and HTE'08.

### Plenary Lecture III

## Emerging Research Directions for Modeling the Impact, Short Time Recuperation and Long Term Recovery in the Case of Natural Hazards



**Professor Mircea Boscoianu**

Military Technical Academy of Bucharest,  
ROMANIA

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**Abstract:** The economic impacts of natural hazards as very low frequency but high impact events are difficult to model in a general approach (because hazards strike are unique in the way they impact a different place; damages are difficult to quantified especially in poor areas; the largest economic impact is on stock variables, capital and labor, while economic indicators measure flows).

Previous work in modeling strategies (Dacy and Kunreuther, *The Economics of Natural Disasters*, 1969; Sorkin, 1982; Albala-Bertrand, 1993; Kunreuther, 1978; Kunreuther, 1996; Kunreuther, Roth, 1998) are based on classical frameworks, but little has been dealt with a general theory on economics of natural hazards. Some authors proposed an analysis based on similarities with business cycles, risk aversion and insurance. In his review, Skoufias (2003) addresses some problems related to the analogies of the economic impact of natural disasters, with economic crises: the return to the previous growth path and long term consequences, the problems which arise after the natural disaster in medium term, the psychological impacts of a natural hazard). Other recent studies in the field of economic analysis of natural hazards (Cochrane, 2004; Cole, 2004, Okuyama, 2004) are more focused on modeling spatial economic impacts of disasters in a regional context.

The lack of robust theoretical development/ analyses of natural hazards impact to economy is due to the fact that natural hazards are quite different from other economic events, in terms of its frequency, extent and global impact, predictability. These aspects pose totally different set of impacts to economy and require a special treatment of economic behavior changes under the chaotic situation after a hazard.

The presentation is organized as follows:

- a review and a comparative analysis of the theoretical aspects in the field of natural hazards
- aspects and models for the short-term recuperation; the limits of the decision-making theory and laws of demand and supply from microeconomic theory
- an analysis of the models capable to estimate the impacts of long-term recovery; the efficiency of different growth models and valuing the macroeconomic risk
- future research directions in the field of economics of natural hazards: new perspectives on the REH (rational expectations hypothesis), the use of statistical decision theory and the choice theory under uncertainty (to explore the ramifications of model uncertainty and learning in environments in which historical data may be insufficient to yield acceptable probability statements), the role of uncertainty in the exploration of hypothetical government/ public-private-partnership interventions.

**Brief Biography of the Speaker:** Mircea Boscoianu was born at 29.04.1966 in Suceava, Romania. He is Romanian citizen, non married. He graduated the Faculty of Integrated Systems of Armament, Aerospace Engineering in the Military Technical Academy of Bucharest (1990) and the Faculty of Cybernetics in the Academy of Economic Studies of Bucharest (1996). His first PhD was in Aerospace Engineering (1993-1999) in Military Technical Academy and the second in Cybernetics and Statistics (2000-2003) in the Academy of Economic Studies of

Bucharest.

His research and teaching activities (1990-2008, Military Technical Academy, Dept of Integrated Aeronautical Systems and Mechanics) covered an extended area of Aerospace Engineering, Cybernetics, Statistics and interdisciplinary domains like mini and micro Unmanned Aerial Vehicles, Risk Management, Management of Extreme Risk Events, Soft Computing. He is author/ co-author of more than 120 published papers and has contributed to more than 10 books in these fields. Mircea Boscoianu has 5 participations in WSEAS Conferences with 15 papers. He was the Head of Saphire-FAI Programme (2006-2008) and is member of the Astronautical Commission of the Romanian Academy since 2005.

Mircea Boscoianu has an interesting experience in national projects/ programs (5 projects in CNCSIS 2003, CEEEX 2005, SECURITY 2005, PN2 2007 as general manager and many projects as assistant manager and scientific/ economical manager) and he contributed as a member in one FP5 project and two FP7 proposals (FP7-SEC2007-3.3.01, FP7-SEC2007-4.3.01).

## Special Session I

### Sustainable Railway Transportation



**Organizer:**

**Professor Gheorghe Manolea**  
Chair of Electromechanical Department,  
Faculty of Engineerings in Electromechanical,  
Environment and Industrial informatics,  
University of Craiova, ROMANIA;

President of Branch Dolj of Romanian General Association of Engineers;  
Manager of Innovations and Technological Transfer Center Craiova.

E-mail: [ghmanolea@gmail.com](mailto:ghmanolea@gmail.com)

**Topics:**

Topics of interest for submission include, but are not limited to:

- Advanced transport systems
- Intelligent transport systems
- GPS / GIS technology applications
- Railway traction systems
- Signaling, control and communications
- Sustainable Transportation
- Transport modelling and simulation
- Transportation Systems and Environment
- Transportation Systems and Social Policy
- Urban transport planning and management
- And others interested in improving transportation through technology

**Brief Biography of the Organizer:**

Name: Gheorghe Manolea

Date and place of birth: 9 March 1948, Deleni, Mehedinti, Romania

Marital Status: Married

University Studies: Technical University Of Petrosani, 1970

Dissertation: A Contribution to Intrinsic Safety protection of the Automation and Telemechanic Elements in Explosive Atmosphere, 1981, Petrosani

Affiliation: University of Craiova, Romania, Faculty of Engineering in Electromechanics and Environment

Didactic Rank: University professor teaching:

- Electromechanical Drives

- Using Computers in Electrical Drives
- Other functions

Scientific secretary of the Professors Board of the Electromechanical Faculty 1990-1992

The head of the Electromechanical department since 1992

The head of the Innovation Center and Technological Transfer of Romania since 1992

Printed Materials 8 Books, 39 articles published in the Reviews

22 University Courses, Workshops, Exercise collections published by the University of Craiova and Technical University of Petrosani.

Scientific Papers 107 scientific papers presented at national and international scientific conferences.

Inventions 7

Scientific Research 89 contracts with various institutions.

Membership of scientific and professional associations .

President of the Romanian Association of Inventors, Dolj branch, since 1990

Electrical drives Association International Federation of Inventors Associations IFIA member corresponding

President of the General Association of the engineers in Romania AGIR, Dolj- Branch, since 1997

President of the NGO "OLTENIA" FRANTA Association since 1997

Editorial activity: Redactor chief assistant Review 3I "Information, Innovation, Engineering" since 1998 .