



RECENT RESEARCHES in ENERGY & ENVIRONMENT

**6th IASME / WSEAS International Conference on ENERGY &
ENVIRONMENT (EE '11)**

**Cambridge, UK
February 23-25, 2011**

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Preface

This year the 6th IASME / WSEAS International Conference on ENERGY & ENVIRONMENT (EE '11) was held in Cambridge, UK, February 23-25, 2011. The conference remains faithful to its original idea of providing a platform to discuss power generation, power plants, solar power, photovoltaic energy, fuel cells, environmental issues, electric vehicles, hybrid vehicles, transmission planning, transformers, circuit breakers, sustainable management, cleaner energy systems, energy storage, materials chemistry, electrochemistry, cogeneration systems, environmental management, biodiversity, sustainability indicators, natural resources management, feasibility analysis etc. with participants from all over the world, both from academia and from industry.

Its success is reflected in the papers received, with participants coming from several countries, allowing a real multinational multicultural exchange of experiences and ideas.

The accepted papers of this conference are published in this Book that will be indexed by ISI. Please, check it: www.worldses.org/indexes as well as in the CD-ROM Proceedings. They will be also available in the E-Library of the WSEAS. The best papers will be also promoted in many Journals for further evaluation.

A Conference such as this can only succeed as a team effort, so the Editors want to thank the International Scientific Committee and the Reviewers for their excellent work in reviewing the papers as well as their invaluable input and advice.

The Editors

Table of Contents

Plenary Lecture 1: Strategies of Developing Road Transport by Controlling Automotives' Emissions to Reduce Local and Global Environment Impacts <i>Corneliu Cofaru</i>	14
Nanostructuration of Black Nickel Low Cost Solar Absorbing Electrodeposited on C81100 High Conductive Copper <i>Ricardo Luiz Perez Teixeira, Renata Antoun Simao, Bruno Coelho, Armando Coelho Oliveira</i>	17
Climate Change in the XXIst Century: Mechanisms and Predictions <i>Igor Khmelinskii, Peter Stallinga</i>	26
Diffusion of Biostimulator in Curing Cultural Plants <i>Karel Kolomaznik, Jiri Pecha, Dagmar Janacova, Vladimir Vasek</i>	32
On-line Operating Adjustment of Small Biomass Fired Boilers Optimizing CO and NOx Emissions <i>Jan Hrdlicka, Bohumil Sulc</i>	35
Biofuels, the Black Swan of the Renewable Energies' Policy in Portugal <i>Jose Antonio Porfirio</i>	41
Business Plan Model for Bio-Energy Companies <i>Pasi Ojala</i>	47
Refrigeration Needs for Sustainable Preservation of Horticultural Products <i>Custodia Gago, Ana Rita Sousa, Miriam Juliao, Graca Miguel, Dulce Antunes. Thomas Panagopoulos</i>	53
Improvement of Power System Stability using Fuzzy Logic based HVDC Controls <i>B. Nagu, A. Navaneetha, P.V. R. Rao</i>	58
Improving Voltage Quality in Distribution System with Wind Turbines <i>Masoud Sargazikoosheh, Banafsheh Hashemi</i>	65
Solar Heating/Cooling and Domestic Hot-Water Systems <i>Ioan Sarbu, Marius Adam</i>	69
Effects Analysis of Building Thermal Rehabilitation <i>Ioan Sarbu, Calin Sebarchievici</i>	75
Temperature and Current Density Distribution in a Bimetallic Conductor through a Coupled Model <i>Oscar Chavez, Federico Mendez</i>	81
Technical Analysis of the Boiler's Work Process <i>Xhevat Berisha, Bedri Dragusha</i>	87

A Study of Energy Use in Taiwan	92
<i>Hsieh-Hua Yang, Hung-Jen Yang, Wan-Ching Wu, Lung-Hsing Kuo, Lan-Hua Wang</i>	
Knowledge for Household Energy: A Technological Method Approach	99
<i>Jui-Chen Yu, Hung-Jen Yang, Hsueh-Chih Lin, Lung-Hsing Kuo, Shang Ming Su, Chang-Tzuoh Wu, Hsieh-Hua Yang</i>	
Determining the Relation between Soil Erodibility and Spatial Variability of Erosion Properties Using Geostatistical Techniques at the Alqueva Reservoir Area	105
<i>Thomas Panagopoulos, Vera Ferreira, Jorge Jesus</i>	
Integrating Reliability, Risk Analysis and Quality Management in Wastewater Treatment Facilities	111
<i>Ilias Konstantinou, Fragiskos Batzias, Athanasia Bountri</i>	
The Human Capital in the Innovation Economics of the Developed Countries	117
<i>Mirela Stoican, Adina Liana Camarda, Plesa Doru</i>	
Implementation of a Transmission Line Model with the PEEC Method for Lightning Surge Analysis	123
<i>Peerawut Yutthagowith</i>	
Effect of Organic Loading Rate on Bio-hydrogen Production from Sweet Sorghum Syrup by Anaerobic Mixed Cultures in Anaerobic Sequencing Batch Reactor	128
<i>Piyawadee Saraphirom, Alissara Reungsang</i>	
Romania's Energy Market. Challenges and Mergers	134
<i>Eugen Bradean, Georgeta Vintila</i>	
Catalytic Pyrolysis of Xylan-Based Hemicellulose over Zeolites	137
<i>Xiujuan Guo, Shurong Wang, Yan Zhou, Zhongyng Luo</i>	
Penetration Estimation of VSD in the Future by Using Energy Efficiency Potential Study	143
<i>Jongryul Won</i>	
Building Energy Consumption and CO₂ Emissions in China	146
<i>Zhou Wei, Mi Hong</i>	
Influence of Seasonal Variations on Ambient Air Quality in Al Jahra Governorate, in the State of Kuwait	151
<i>Raslan Alenezi</i>	
On the Validity of the Law of Diminishing Returns in Packed Bed Columns Used for Wastewater Treatment	160
<i>Dimitris Sidiras, Athanasia Bountri, Ilias Konstantinou, Fragiskos Batzias</i>	
GPS Solutions for Roads. Different GPS Operation Types and Applications	166
<i>Nicolae Ion Babuca</i>	
Comparative Risk Analysis of Development of the Lignite Basins in Serbian Part of the Danube Region	171
<i>Slavka Zekovic, Tamara Maricic</i>	

The Wear of Metal Carbide Stuck Circular Saw Blades Used in the Spruce Longitudinal Sawing Processing – A Factor Influencing Power Consumption	177
<i>Cosmin Spirchez, Anne-Marie Loredana Badescu, Valentin Ditu, Nicolae Taran, Oana-Andreea Pirnuta</i>	
Understanding Electric Industrial Ecosystems through Exergy	182
<i>Cornelia A. Bulucea, Doru A. Nicola, Nikos E. Mastorakis, Marc A. Rosen</i>	
Water Efficiency in Buildings: Assessment of its Impact on Energy Efficiency and Reducing GHG Emissions	191
<i>A. Silva-Afonso, F. Rodrigues, C. Pimentel-Rodrigues</i>	
Macro and Microclimate – from Beneficial to Noxious Action on the Animals	196
<i>Violeta-Elena Simion, Alexandru T. Bogdan, Viorel Andronie, Iudith Ipate, Monica Parvu, Brindusa Covaci, Elena Mitranescu, Cristina Andronie</i>	
Towards A Unified Cost Optimal Methodology for Designing Low Energy Buildings in the Mediterranean Sea Region	202
<i>Stratis Kanarachos, Ahmed Medhat, Georgette Kanarachou, Mona Fanny</i>	
Distance Protection for Smart Grids with Massive Generation from Renewable Sources	208
<i>Francesco Muzi, Antonio De Sanctis, Pasquale Palumbo</i>	
Gene Bank Valuable Genotypes of Animals in Romania and Hungary with Biotechnology Reproduction	214
<i>Iudith Ipate, Alexandru T. Bogdan, Janos Seregi, Laszlo Zoldag, Akos Maroti-Agots, Monica Gutschery, George Toba, Marcel Th. Paraschivescu, Amalia Strateanu, Cristinel Sonea, Simona Ivana, Mihai Enache</i>	
Using Bioinformatics and Reproduction Indicators for Understanding the Relationships that Environmental Influence Cows' Milk Production	224
<i>Costel Ilie, Culai Dascalu, Alexandru T. Bogdan, Sorin Chelmu, Cristinel Sonea, Mihaela Rusu, Simona Stan, Ion Constantinescu, Stefan Nastasie, Dan Tapus</i>	
On the Leverage Effect in the Spanish Electricity Spot Market	230
<i>J. M. Montero, M. C. Garcia, G. Fernandez-Aviles</i>	
Strategies of Developing Road Transport by Controlling Automotives' Emissions to Reduce Local and Global Environment Impacts	236
<i>Corneliu Cofaru</i>	
Study Regarding the Noise Mapping of Tg. Mures Urban Transportation	244
<i>Janos Timar, Corneliu Cofaru, Daniela Florea, Anghel Chiru, Mariana Stanciu, Dinu Covaciu</i>	
The Influence of Technological Factors on Cow Milk Production in Zootechnic Ecosystems from Vrancea County in Romania	248
<i>Culai Dascalu, Alexandru T. Bogdan, Alexandru Sonea, Paul Rodian Tapaloaga, Sorin Sergiu Chelmu, Cristinel Sonea, Radu Burlacu, Ion Constantinescu, Costel Ilie, Elisabeta Claudia Dascalu, Stefan Nastasie, Dan Tapus</i>	
The Ethical Dimension of the Romanian Scientific Research for Sustainable Development	255
<i>Aurel Ardelean, Aurel Pisoschi, Alexandru T. Bogdan, Valentin Pau, Brindusa Covaci, Mihai Covaci</i>	
A Theoretical Approach for Dynamic Modelling of Sustainable Development	261
<i>Corina-Maria Ene, Anda Gheorghiu, Anca Gheorghiu</i>	

The Conflict between Economic Development and Planetary Ecosystem in the Context of Sustainable Development	266
<i>Corina-Maria Ene, Anda Gheorghiu, Cristina Burghilea, Anca Gheorghiu</i>	
A Sustainable Urban Center Refurbishment	272
<i>Ana Karina Lopes, Fernanda Rodrigues, Victor M. Ferreira, Romeu Vicente</i>	
Heavy Metals Hazardous Components of Eaf Dust	278
<i>Cristiana-Zizi Rizescu, Zorica Bacinschi, Elena Valentina Stoian, Aurora Poinescu, Dan Nicolae Ungureanu</i>	
Researches Regarding the Recovery of Small and Powder Ferrous Wastes within Iron-and-Steel Industry	282
<i>Socalici Ana, Heput Teodor, Ardelean Erika, Ardelean Marius</i>	
Effect of Contact Resistive Variations of Screen Printed Si Solar Cell	288
<i>A. W. Shahrul, M. Y. Khairy, S. L. Cheow, N. Amin, S. H. Zaidi, A. Zaharim, K. Sopian</i>	
Entropy Generation Analysis of the MHD Flow over Nonlinear Permeable Stretching Sheet with Partial Slip	292
<i>M. H. Yazdi, S. Abdullah, I. Hashim, A. Zaharim, K. Sopian</i>	
Monthly Performance of a Photovoltaic Thermal (PV/T) Water Heating System	298
<i>Roonak Daghigh, Mohd Hafidz Ruslan, Azami Zaharim, Kamaruzzaman Sopian</i>	
Effect of Packing Factor on the Performance of PV/T Water Heater	304
<i>R. Daghigh, M. H. Ruslan, A. Zaharim, K. Sopian</i>	
Thin-Layer Drying Characteristics of Banana Slices in a Force Convection Indirect Solar Drying	310
<i>M. I. Fadhel, Ramez Abdulwasea Abdo, B. F. Yousif, Azami Zaharim, K. Sopian</i>	
Glazing Facades in the 1930s: Preservation or Rehabilitation?	316
<i>Francesca Albani</i>	
Energetic and Environmental Analysis of a Micro CCHP System for Domestic Use	322
<i>Krisztina Uzunianu, Dan Scarpete</i>	
The Certification as a Tool for Environmental Management of Social Events	328
<i>Veronika Jasikova, Vladimir Bures, Petra Maresova</i>	
Self Oxidation of Romanian Lignite During Storage	335
<i>Mihai Cruceru, Bogdan Diaconu, Popescu Lumini</i>	
Investments in Energy Efficiency. A Case Study.	341
<i>Mihai Cruceru, Adrian Gorun, Bogdan Marian Diaconu</i>	
The Impact of Globalization on the Development of Rural Communities from Romania. Case study: The Main Social Problems Generated by Degradation of the Environment in the Rural Communities from Gorj County	347
<i>Adrian Gorun, Luminia Georgeta Popescu, Horatiu Gorun, Mihai Cruceru</i>	
Numerical Calculation of Thermal Field Distribution in Oil Immersed Power Transformer - A Comparison of Methods	353
<i>Vlado Madzarevic, Izudin Kapetanovic, Majda Tesanovic, Mensur Kasumovic</i>	

Carbon Dioxide Levels in Educational Institutions	359
<i>Allan Hani, Teet-Andrus Koiv, Alo Mikola</i>	
A Probabilistic Nodal Analysis for Helping the System Operator to Validate the Results of the Day-Ahead Electricity Market	365
<i>Davide Poli, Paolo Pelacchi</i>	
E.U. Environmental Policies: A Document – based Qualitative Research	372
<i>Iuliana Pop, Madalina-Teodora Andrei, Charlotte Valentine Ene, Florin Vartolomei, Petronela-Sonia Nedea, Radita Alexe</i>	
Photovoltaics in the Czech Republic – Example of a Distorted Market	378
<i>Lubos Smrcka</i>	
Load Forecast under Uncertainty: An Innovative Approach beyond GDP Growth	384
<i>Leontina Pinto, Luiz Macedo, Daniel Sica, Mirian Gomes</i>	
Authors Index	389

Plenary Lecture 1

Strategies of Developing Road Transport by Controlling Automotives' Emissions to Reduce Local and Global Environment Impacts



Professor Corneliu Cofaru
Automotive and Engine Department
Mechanical Engineering Faculty
Transilvania University of Brasov
Romania
E-mail: ccornel@unitbv.ro

Abstract: This research paper presents an overview of policies and methods of controlling the emissions caused by motor vehicles and road traffic to reduce local and global pollution. The main premise is the fact that individual mobility and modern freight transport system should include the idea of people's well-being, quality of life, freedom, all these being parts of the social and cultural context. In this case, the mobility of tomorrow will be more environment-friendly, resource lean, quieter, safer, geared to individual mobility needs and seamless logistics. Highly efficient, innovative powertrain technologies and alternative fuels will have a key-role in this respect.

Therefore, effective policies must meet multiple objectives such as:

- Establishing a balance among different solutions of power trains: ICEs, Hybrid, and Electric Vehicle. Petroleum-based fuels will continue to be the foundation of mobility in the coming years. The main reasons lie in the extremely high energy density of diesel and petrol, whereby large distances can be covered using a relatively small volume of fuel, and in efficient combustion engine technology. The introduction of electric vehicles on the market will encompass: hybrids (micro, mild, full and plugin hybrid electric vehicle – PHEV), range extender electric vehicle (REEV), battery electric vehicle (BEV) and fuel cell vehicles (FCV). In the future, other powertrain technologies as hydrogen-powered vehicles will be able to contribute to climate protection.
- Providing security of fuel's supply by using alternative fuels. Such alternative fuels can be methyl or ethyl esters (biodiesels), biogases (digester gas, wood gas, gas from biomass gasification, ...), alcohols from biomass (methanol, ethanol, ...), vegetable oils, animal fats, etc. , or even hydrogen.
- Defining a conclusive mobility concept. This concept is materialized through a sustainable, consistent transport policy for economic growth and efficient environmental protection; investment in good transport routes based on needs and promotion of intelligent traffic systems (real-time traffic information, dynamic parking space management, fleet management systems and powertrains assistance systems, ICT in logistics).
- Reducing chemical and noise pollution caused by motor vehicles by controlling emissions. At present, all studies shows that is no doubt that the internal combustion engine (ICE) will be the main propulsion technology for road transport for a long time, there is no doubt that we have to find alternative fuels, to replace the derivatives from crude oil, such as gasoline and diesel. Simultaneously, the alternative fuels should decrease the noxious emissions (NO_x, particles) and decrease the net greenhouse gas emissions (CO₂). Biofuels constitute a central pillar of sustainable mobility and they have the advantage of not requiring essentially new engines or a new infrastructure, since they can be added to fossil fuels in a controlled form (biodiesel can only be added to a maximum 7% of the fossil fuel).

Brief Biography of the Speaker: Corneliu Cofaru is a full Professor at the Automotive and Engine Department within the Mechanical Engineering Faculty from Transilvania University of Brasov, Romania. His area of expertise is the environmental aspects of internal combustion engines. He authored or co-authored over 200 scientific papers published in reviewed journals or presented at international conferences organized by FISITA, EAEC, SIAR, etc. He wrote as author and co-author 23 books. Two of these are written in English and are entitled: "Materials-Energy Sustainable Development" published in 2002 and „Transport and Environmental Engineering" published at the Transilvania University Publishing House in 2007. He had the opportunity to manage international projects in Tempus and Leonardo da Vinci frame and he is a member of Romanian society of automotive engineers. He is Deputy Dean of the Mechanical Engineering Faculty.

He serves as an associate editor of some scientific journals, including IEEE Transactions on Industrial Electronics, member of editorial board of Journal of Advanced Computational Intelligence, member of various national and international scientific committees. He is the founder of the IEEE International Conference Series on Intelligent Engineering Systems (INES) and IEEE International Conference on Computational Cybernetics (ICCC), and some

international symposia. He has served as General Chairman and Program Chairman of numerous scientific international conferences.

His present areas of research activity are Computational Cybernetics, Robotics with special emphasis on Robot Control, Soft Computing, Computed-aided Process Planning, Fuzzy Control and Fuzzy Sets. He has published books, more than 450 papers in books, various scientific journals and international conference proceedings. He received more than 600 citations for his publications.

Authors Index

Abdo, R. A.	310	Ditu, V.	177	Loredana Badescu, A.-M.	177
Abdullah, S.	292	Doru, P.	117	Lumini, P.	335
Adam, M.	69	Dragusha, B.	87	Luo, Z.	137
Albani, F.	316	Enache, M.	214	Macedo, L.	384
Alenezi, R.	151	Ene, C. V.	372	Madzarevic, V.	353
Alexe, R.	372	Ene, C.-M.	261, 266	Maresova, P.	328
Amin, N.	288	Fadhel, M. I.	310	Maricic, T.	171
Andrei, M.-T.	372	Fanny, M.	202	Maroti-Agots, A.	214
Andronie, C.	196	Fernandez-Aviles, G.	230	Mastorakis, N. E.	182
Andronie, V.	196	Ferreira, V.	105	Medhat, A.	202
Antunes, D.	53	Ferreira, V. M.	272	Mendez, F.	81
Ardelean, A.	255	Florea, D.	244	Miguel, G.	53
Ardelean, E.	282	Gago, C.	53	Mikola, A.	359
Ardelean, M.	282	Garcia, M. C.	230	Mitranescu, E.	196
Babuca, N. I.	166	Gheorghiu, Anc.	261, 266	Montero, J. M.	230
Bacinschi, Z.	278	Gheorghiu, And.	261, 266	Muzi, F.	208
Batzias, F.	111, 160	Gomes, M.	384	Nagu, B.	58
Berisha, X.	87	Gorun, A.	341, 347	Nastasie, S.	224, 248
Bogdan, A. T.	196, 214, 224	Gorun, H.	347	Navaneetha, A.	58
Bogdan, A. T.	248, 255,	Guo, X.	137	Nedea, P.-S.	372
Bountri, A.	111, 160	Gutschery, M.	214	Nicola, D. A.	182
Bradean, E.	134	Hani, A.	359	Ojala, P.	47
Bulucea, C. A.	182	Hashemi, B.	65	Palumbo, P.	208
Bures, V.	328	Hashim, I.	292	Panagopoulos, T.	53, 105
Burghelea, C.	266	Hong, M.	146	Paraschvescu, M. T.	214
Burlacu, R.	248	Hrdlicka, J.	35	Parvu, M.	196
Camarda, A. L.	117	Ilie, C.	224, 248	Pau, V.	255
Chavez, O.	81	Ipate, I.	196, 214	Pecha, J.	32
Chelmu, S.	224	Ivana, S.	214	Pelacchi, P.	365
Chelmu, S. S.	248	Janacova, D.	32	Perez Teixeira, R. L.	17
Cheow, S. L.	288	Jasikova, V.	328	Pimentel-Rodrigues, C.	191
Chiru, A.	244	Jesus, J.	105	Pinto, L.	384
Coelho Oliveira, A.	17	Juliao, M.	53	Pirnuta, O.-A.	177
Coelho, B.	17	Kanarachos, S.	202	Pisoschi, A.	255
Cofaru, C.	236, 244	Kanarachou, G.	202	Poinescu, A.	278
Constantinescu, I.	224, 248	Kapetanovic, I.	353	Poli, D.	365
Covaci, B.	196, 255	Kasumovic, M.	353	Pop, I.	372
Covaci, M.	255	Khairy, M. Y.	288	Popescu, L. G.	347
Covaciu, D.	244	Khmeliinskii, I.	26	Porfirio, J. A.	41
Cruceru, M.	335, 341, 347	Koiv, T.-A.	359	Rao, P. V. R.	58
Daghigh, R.	298, 304	Kolomaznik, K.	32	Reungsang, A.	128
Dascalu, C.	224, 248	Konstantinou, I.	111, 160	Rizescu, C.-Z.	278
Dascalu, E. C.	248	Kuo, L.-H.	92, 99	Rodrigues, F.	191
De Sanctis, A.	208	Lin, H.-C.	99	Rodrigues, F.	272
Diaconu, B.	335, 341	Lopes, A. K.	272	Rosen, M. A.	182

Ruslan, M. H.	298, 304	Spirchez, C.	177	Vintila, G.	134
Rusu, M.	224	Stallinga, P.	26	Wang, L.-H.	92
Saraphirom, P.	128	Stan, S.	224	Wang, S.	137
Sarbu, I.	69, 75	Stanciu, M.	244	Wei, Z.	146
Sargazikoosheh, M.	65	Stoian, E. V.	278	Won, J.	143
Scarpete, D.	322	Stoican, M.	117	Wu, C.-T.	99
Sebarchievi, C.	75	Strateanu, A.	214	Wu, W.-C.	92
Seregi, J.	214	Su, S. M.	99	Yang, H.-H.	92, 99
Shahrul, A. W.	288	Sulc, B.	35	Yang, H.-J.	92, 99
Sica, D.	384	Tapaloaga, P. R.	248	Yazdi, M. H.	292
Sidiras, D.	160	Tapus, D.	224, 248	Yousif, B. F.	310
Silva-Afonso, A.	191	Taran, N	177	Yu, J.-C.	99
Simao, R. A.	17	Teodor, H.	282	Yutthagowith, P.	123
Simion, V.-E.	196	Tesanovic, M.	353	Zaharim, A.	288, 292, 298
Smrcka, L.	378	Timar, J.	244	Zaharim, A.	304, 310,
Socalici, A.	282	Toba, G.	214	Zaidi, S. H.	288
Sonea, A.	248	Ungureanu, D. N.	278	Zekovic, S.	171
Sonea, C.	214, 224, 248	Uzuneanu, K.	322	Zhou, Y.	137
Sopian, K.	288, 292, 298	Vartolomei, F.	372	Zoldag, L.	214
Sopian, K.	304, 310	Vasek, V.	32		
Sousa, A. R.	53	Vicente, R.	272		