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Recent Researches in Energy & Environment

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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

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Plenary Lecture 1

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

Professor Corneliu Cofaru
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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 ideea 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. Simultanously, the alternative fuels should decrease the noxious emissions (NOx, 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.