Editors: C.Helmis and S. Celikyay



Lecture Notes on Energy and Environment

 \mathcal{P} ublished by $\mathcal{WSEAS}\mathcal{P}$ ress www.wseas.org

Proceedings of the RENEWABLE ENERGY_SOURCES (RES' 07) Proceedings of the ENERGY PLANNING, ENERGY SAVING, ENVIRONMENTAL EDUCATION (EPESE'07) Proceedings of the WASTE MANAGEMENT, WATER POLLUTION, AIR POLLUTION, INDOOR CLIMATE (WWAI'07)

Arcachon, France, October 14-16

Energy and Environmental Engineering Series A Series of Reference Books and Textbooks ISBN: 978-960-6766-09-1 ISSN: 1790-5095



Lecture Notes on Energy and Environment

Proceedings of the WSEAS International Conference on RENEWABLE ENERGY SOURCES (RES '07)

Proceedings of the WSEAS International Conference on ENERGY PLANNING, ENERGY SAVING, ENVIRONMENTAL EDUCATION (EPESE '07)

Proceedings of the WSEAS International Conference on WASTE MANAGEMENT, WATER POLLUTION, AIR POLLUTION, INDOOR CLIMATE (WWAI '07)

Arcachon, France, October 14-16, 2007

Lecture Notes on Energy and Environment

Proceedings of the WSEAS International Conference on RENEWABLE ENERGY SOURCES (RES '07)

Proceedings of the WSEAS International Conference on ENERGY PLANNING, ENERGY SAVING, ENVIRONMENTAL EDUCATION (EPESE '07)

Proceedings of the WSEAS International Conference on WASTE MANAGEMENT, WATER POLLUTION, AIR POLLUTION, INDOOR CLIMATE (WWAI '07)

Arcachon, France, October 14-16, 2007

Published by World Scientific and Engineering Academy and Society Press http://www.wseas.org

Copyright © 2007, by WSEAS Press

All the copyright of the present book belongs to the World Scientific and Engineering Academy and Society Press. All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted in any form or by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the Editor of World Scientific and Engineering Academy and Society Press.

All papers of the present volume were peer reviewed by two independent reviewers. Acceptance was granted when both reviewers' recommendations were positive. See also: http://www.worldses.org/review/index.html

ISSN: 1790-5095 ISBN: 978-960-6766-09-1



World Scientific and Engineering Academy and Society

EDITORS:

Professor C. Helmis, University of Athens, GREECE Professor S. Celikyay, Zonguldak Karaelmas University Bartin, TURKEY

SCIENTIFIC COMMITTEE:

| M. Cristina Amezquita, COLOMBIA | Pablo Lopez, SPAIN |
|------------------------------------|------------------------------------|
| Joanna Boguniewicz, POLAND | Ion Melinte, ROMANIA |
| Zbigniew Bzowski, POLAND | Homayoun Moghimi, IRAN |
| Roberto De Lotto, ITALY | Jitka Mohelnikova, CZECH REPUBLIC |
| John Gelegenis, GREECE | Jose Navar, MEXICO |
| Carlo Giaconia, ITALY | Agelos Papaioannou, GREECE |
| Anastasia Giannakoula, GREECE | Adrian Rosca, ROMANIA |
| Valentina Golubeva, RUSSIA | Radu Rugescu, UNITED STATES |
| Volker C. Hammen, GERMANY | Roberto San Jose, SPAIN |
| Alice Hatzopoulou, GREECE | Masoomeh Sohrabi-Mollayosefi, IRAN |
| Chih-Hong Huang, TAIWAN | Filippos Vallianatos, GREECE |
| Alexander Iomin, ISRAEL | Bram Van Putten, the NETHERLANDS |
| Kamaruzaman Jusoff, MALAYSIA | Mark Van Wijk, the NETHERLANDS |
| Alexander Kantartzis, GREECE | Shahab Varkouhi, IRAN |
| Christos Karydas, GREECE | Surendra P. Verma, MEXICO |
| Fotini Kehagia, GREECE | Rong Wang, SINGAPORE |
| Reza Khoshraftar, IRAN | Shih-Hung Yang, TAIWAN |
| Chockalingam Letchumanan, MALAYSIA | Dimitrios Yfantis, GREECE |

Proceedings of the WSEAS International Conference on RENEWABLE ENERGY SOURCES (RES '07) <u>TABLE OF CONTENTS</u>

| Evaluation of Photovoltaic System in Detached Houses with All-electrified Residential Equipment <i>Qingrong Liu, Tetsuo Hayashi, Yuji Ryu</i> | 1 |
|---|----|
| Prediction of the Power Ratio and Torque in Wind Turbine Savonius Rotors using Artificial Neural Networks J. Sargolzaei | 7 |
| Increase of Efficiency of Energy System with Heat Pump Using Solar Radiation <i>Petr Mastny, Antonin Matousek</i> | 13 |
| Present Situation of Animal Feeding Farms and CDM Potential for Animal Waste Management System in | 19 |
| China Yingjun Ruan, Weijun Gao, Toshiyuki Watanabe, Haifeng Li, Hongbo Ren, Guoliang Nan, Junsheng Zhou | |
| Production of Biodiesel from Waste Fat and Grease Michio Ikura, Lia Kouchachvili, Gianni Caravaggio | 25 |
| Sustainable Management as a Part of Business Excellence of DEM Davorin Kralj, Marjan Smon, Lilijana Eisner | 31 |
| Vegetable Oil Utilization for Electricity and Heat Generation <i>Ion Oprea, Lucian Mihaescu, Tudor Prisecaru, Gabriel Paul Negreanu</i> | 36 |
| Optimizing Solar Panel Energetic Efficiency using an Automatic Tracking Microdetector <i>P. L. Milea, O. Oltu, M. Dragulinescu, M. Dascalu</i> | 42 |
| Energy Saving Lighting with Light Guides Frantisek Vajkay, Jitka Mohelnikova | 46 |
| Chlorophyll Fluorescence and Photosystem II Activity of Tomato Leaves as Affected by Irradiance and Prohexadione-Calcium Anastasia Giannakoula, Ilias Ilias | 49 |

Proceedings of the WSEAS International Conference on ENERGY PLANNING, ENERGY SAVING, ENVIRONMENTAL EDUCATION (EPESE '07) <u>TABLE OF CONTENTS</u>

| The Improving of the Energetic Regime of the Small Electric Arc Furnaces, working with Foaming Slag Ion Melinte, Mihaela Balanescu, George Darie | 61 |
|---|-----|
| Phase Swapping for Distribution System Using Tabu Search Marilyne Lafortune, Derrick Bouchard, Jordan Morelli | 67 |
| Predicting the Performances of Biogas Fuelled Distributed Power-Only Generation Micro Gas Turbines, with Internal Heat Recovery <i>Victor Cenusa, Florin Alexe</i> | 72 |
| Development of a New Approach for Synthesizing Heat Exchanger Networks to Save Energy in Chemical Plants Roghayeh Lotfi, Ramin Bozorgmehry | 78 |
| Education for Energy Saving in the House Adriana Alexandru, Elena Jitaru | 84 |
| An Integrated Web-GIS Knowledge Management System to Enhance and Promote Knowledge on Sustainable Energy Technologies Janjira Payakpate, Chun Che Fung, Sukrudee Nathakaranakule, Dora Marinova | 90 |
| The Scene Classification based on Topological Properties Liu Shuoyan, Xu De, Yang Xu | 96 |
| The Crisis of Gasoline Consumption in the Iran's Transportation Sector S. Sattari, H. Houri Jafari, A. Baratimalayeri | 100 |
| Optimization Supplying of Electricity and Heat Energy – An Aspect of Sustainability in the Hospital Maribor <i>Gregor Pivec, Lilijana Eisner, Davorin Kralj</i> | 111 |
| Health Care and Waste Treatment Marko Stamenkovic, Davorin Kralj | 116 |
| Energy Conservation Opportunities: Sugar Industry in Iran Sourena Sattari, Akram Avami, Bahare Farahmandpour | 120 |
| System Analysis of Mobile CNG Transport as a Way to Supply Temporary Energy End-Users Sorena Sattari, Ramin Roshandel | 127 |
| Analysis and Assessment of Energy Situation of Brick Industry in Iran Sourena Sattari, Akram Avami | 136 |
| Green Campus Community Management Using Fuzzy Analytic Hierarchy Process Evaluates in Taipei Wen-Zer Lin, Chih-Hong Huang, Kuei-Yang Wu, Shu-Chu Cheng, Chin-Huang Hsieh | 143 |
| Evaluation of Energy Consumption and Indoor Air Quality of a Low Energy Row House <i>Tomas Hlavacka</i> | 151 |
| Energy Balance of Iran S. Sattari, H. Houri Jafari, A. Baratimalayeri | 155 |

Proceedings of the WSEAS International Conference on WASTE MANAGEMENT, WATER POLLUTION, AIR POLLUTION, INDOOR CLIMATE (WWAI '07) <u>TABLE OF CONTENTS</u>

| Examining the Relative Contribution of Ventilation and Deposition Rates on Indoor SO2 Concentrations <i>Christos H. Halios, Costas G. Helmis</i> | 163 |
|---|-----|
| Mathematical Modelling of a Living Room with Solar Radiation Source and Different Boundary Conditions Stanislavs Gendelis, Andris Jakovics | 168 |
| Modelling of the Integrated Waste Management Systems using Object-Oriented Methodology Krzysztof Gaska, Krzysztof Pikon | 174 |
| Mathematical Model of Pollutants Emission from Biomass and Sewage Sludge Co-Combustion Process Jan Nadziakiewicz, Rafal Czekalski | 184 |
| Implementing the RAMS-CALMET-CALGRID Modelling System to Assess Seasonal Ozone Pollution: A Five-Month Application over Tuscany Region <i>G. Gualtieri, F. Calastrini, C. Busillo, G. Pirovano</i> | 190 |
| Numerical Study of Pollutant Gases yield from Combustion of Residual Steel Gases <i>Ion V. Ion, Florin Popescu, Lucian Georgescu</i> | 196 |
| Heat Exchanger Performance Prediction Modeling using NARX-type Neural Networks M. Ramasamy, H. Zabiri, N. T. Thanh Ha, N. M. Ramli | 202 |
| Decision Support Systems used in Water Management Marius Cioca, Lucian-Ionel Cioca, Cosmin Cioranu | 208 |
| Environmental Waste Management in Constructions Lilijana Eisner, Klavdij Kovacic, Davorin Kralj | 212 |
| Management of Lignite Combustion Waste from Kosova Power Plants - Fly Ash use Posibilities I. Krasniqi, Sh. Kelmendi, I. Zeqiri | 217 |
| Researches Regarding the Physiological Response Induced by Atmospheric Pollutants on Gymnosperm Species in the Industrialized Areas of Romania <i>Zenovia Olteanu, Maria-Magdalena Zamfirache, Lacramioara Ivanescu</i> | 223 |
| Physiological Modifications Induced by Atmospheric Pollutants on Gymnosperm Species in the Industrialized Areas of Romania Maria-Magdalena Zamfirache, Lacramioara Ivanescu, Zenovia Olteanu | 228 |
| Cito-Histological Changes due to the Action of Atmosphere Pollutants on Three Species of Gymnosperms Lacramioara Ivanescu, Irina Gostin | 234 |
| Theoretical Assessment of the Indoor Environmental Conditions in an Office V. D. Assimakopoulos, O. I. Stathopoulou, C. G. Helmis | 240 |
| Emissions from the Military Vehicles Hana Gavendova, Alena Bumbova | 244 |
| Coburning of Formed Fuel with Hard Coal in the Stoker-Fired Boiler Furnace J. W. Wandrasz, K. Gaska, M. Koziol, M. Landrat, W. Scierski, A. J. Wandrasz | 248 |

| Study of the Possibility of Rhenium Extraction and Preconcentration from Plants <i>Christina Tzvetkova, Ognyan Bozhkov, Elena Russeva</i> | 253 |
|--|-----|
| Plant Biosphere - Natural Extractor and Concentrator of Rhenium from Soils and Waters Ognyan Bozhkov, Christina Tzvetkova, Temenuzhka Blagoeva | 257 |
| Geochemical Evaluation of Lead Trace Element in Streambed Sediments Shahab Varkouhi | 262 |