



**Editors: Nicu Gavriluta, Razvan Raducanu, Mihaela Iliescu,  
Hariton Costin, Nikos Mastorakis, Vladimir Olej, Jiri Strouhal**

# **Recent Researches in Environment, Energy Planning & Pollution**

- **Proceedings of the 5<sup>th</sup> WSEAS International Conference on Renewable Energy Sources (RES '11)**
- **Proceedings of the 5<sup>th</sup> WSEAS International Conference on Energy Planning, Energy Saving, Environmental Education (EPESE '11)**
- **Proceedings of the 5<sup>th</sup> WSEAS International Conference on Waste Management, Water Pollution, Air Pollution, Indoor Climate (WWAI '11)**

**Sponsor and Host:**

**The Alexandru Ioan Cuza University of Iasi**



**Iasi, Romania, July 1-3, 2011**



**ISBN: 978-1-61804-012-1**





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Published by WSEAS Press

[www.wseas.org](http://www.wseas.org)

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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>

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**Preface**

This year the 5th WSEAS International Conference on RENEWABLE ENERGY SOURCES (RES '11), the 5th WSEAS International Conference on ENERGY PLANNING, ENERGY SAVING, ENVIRONMENTAL EDUCATION (EPESE '11) and the 5th WSEAS International Conference on WASTE MANAGEMENT, WATER POLLUTION, AIR POLLUTION, INDOOR CLIMATE (WWAI '11) were held in Iasi, Romania, July 1-3, 2011. The conferences provided a platform to discuss wind energy, hydrogen energy, biomass, solar energy, photovoltaic systems, geothermal energy, hydroelectric energy -- small hydro plants, energy planning studies, bio-diversity, materials chemistry, forestation, education on ecosystems, waste management, water pollution, air pollution, indoor climate etc. with participants from all over the world, both from academia and from industry.

Their 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 these conferences are published in this Book that will be indexed by ISI. Please, check it: [www.worldses.org/indexes](http://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.

Conferences such as these 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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