
**NEW AND RENEWABLE
TECHNOLOGIES FOR
SUSTAINABLE DEVELOPMENT**

NEW AND RENEWABLE TECHNOLOGIES FOR SUSTAINABLE DEVELOPMENT

edited by

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PREFACE

Sustainable development encompasses economic, social, and ecological perspectives of conservation and change in natural resources. It is generally defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This definition is based on the ethical imperative of equity within and between generations. Moreover, apart from meeting; “the basic needs of all”; sustainable development implies sustaining the natural life-support systems on Earth, and extending to all the opportunity to satisfy their aspirations for a better life. Hence, sustainable development is more precisely defined as a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both current and future potential to meet human needs and aspiration.

To date, various definitions and stationary-state criteria of sustainability have been proposed. Many authors have been concerned with only part of the problem, such as the technological assumptions, the ability to substitute natural resources in economic transformation processes, and the resilience and importance of ecological processes. But, the social dimension did not receive the same attention, and has not been adequately integrated into formal analysis.

The engineering community has to play an important role in sustainable development with appropriate evaluation of the engineering systems. In this respect energy, water and environment systems require multi-criteria evaluation methods for the assessment of the economic, environmental and social aspect of the systems.

New and renewable energy systems will play an important role in the sustainable development of a future energy strategy. Recent development in this field has proved that the virtual energy system including new and renewable energy sources is feasible. The promotion of renewable sources of energy is a high priority, for reasons of security and diversification of energy supply, for reasons of environmental protection and for reasons of social and economic cohesion.

Renewables play an important role in the process of integrating the environment into energy policy, in the objectives of sustainable development and in integrating environmental policy.

The International Conference on New and Renewable Technologies for Sustainable Development has provided technology specialists and hardware developers with the opportunity to discuss, review and demonstrate the research directions, the design methodologies, and the production techniques leading to cost-effective energy technologies for sustainable development. The papers included in this volume are selected from those presented at the Conference reflecting the present state-of-the-art in the field.

This book comprises six chapters devoted to different aspects of New and Renewable Technologies for Sustainable Development. The first chapter is devoted to the sustainable development of energy strategy and includes 8 papers. The second chapter includes 13 papers presenting economic evaluations of new and renewable energy sources. The third chapter is comprised of 8 papers devoted to solar energy utilisation.

The fourth chapter has 5 papers presenting the state-of-the-art in fuel cell development.

The fifth chapter includes 15 papers with emphasis on biomass and waste energy utilisation. Finally, the sixth chapter comprise 5 papers devoted to geothermal and ocean energy utilisation.

The Editors would like to express their great appreciation for the work of to Mrs. Maria Fernanda Afonso, the technical editor of the book, for her excellent work in organising the preparation of the manuscripts for the book. The Editors would also like to express their sincere gratitude to Ms. Fernanda Martins, for her devoted work in typing and reediting the text of the papers included in the book.

The Editors