

6TH MIAMI
INTERNATIONAL CONFERENCE ON
ALTERNATIVE ENERGY SOURCES

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Clean Energy Research Institute
College of Engineering
University of Miami, Coral Gables, Florida

In cooperation with:

International Association for Hydrogen
Energy
International Atomic Energy Agency
International Solar Energy Society
International Association of Housing
Science
Florida International University
Florida Solar Energy Center
Mechanical Engineering Department,
University of Miami



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FOR RURAL DEVELOPMENT

1987

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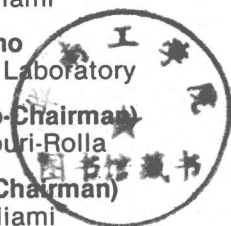
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The Conference Committee gratefully acknowledges the assistance and cooperation of the International Association for Hydrogen Energy, International Atomic Energy Agency, International Solar Energy Society, Florida International University, Florida Solar Energy Center and the Department of Mechanical Engineering, University of Miami.

We also wish to extend sincere appreciation to the Keynote Speaker, L.W. Zelby, Professor of Energy Economics, University of Oklahoma, and to the Banquet Speaker, Robert C. Odle, Jr., Assistant Secretary for Congressional, Intergovernmental and Public Affairs, U.S. Department of Energy.

Special thanks are due to our authors and lecturers, who have provided the substance of the conference, as published in condensed form in the present Proceedings.

And last, but not least, our debt of gratitude is owed to the Session Chairpersons and Session Co-Chairpersons for the organization and execution of the technical sessions.

Organizing Committee
6th Miami International Conference
on Alternative Energy Sources
December 1983



FOREWORD

Fossil fuels, particularly oil and gas, which presently provide most of our energy needs, are rapidly being depleted. Coal has been less rapidly utilized because it is less convenient and creates more environmental problems.

Alternative sources of energy are available but are relatively undeveloped technologically or not utilized fully. Some of these are renewable, such as solar heat, solar electricity, hydro, wind, ocean thermal and salinity gradient energy. Others are depletable but relatively untapped, such as geothermal heat or synthetic fuels from coal or wastes. Nuclear energy as presently utilized depletes uranium more rapidly than energy from breeder reactors. Nuclear fusion is still a hope for the future. Hydrogen is a suitable synthetic fuel for many applications and has an unlimited raw material base — water. It requires the development of an environmentally acceptable energy source, preferably non-depleting, to produce it.

This 6th conference, as its successful predecessors, the 1st, 2nd, 3rd, 4th and 5th Miami International Conferences on Alternative Energy Sources, addresses itself to all aspects of the alternative energy sources. It includes sessions on solar energy, wind energy, geothermal energy, bioconversion, ocean energy, hydro energy, nuclear energy, hydrogen energy, synthetic fuels from coal and other sources, formulation of workable policies on energy use and energy conservation. Sessions on the environment and energy education are also included.

The overall objective of the conference is to inform those who attend of the present state of the art and rate of progress in each of the alternative energy forms. This will include the latest information on the status of alternative energy sources research, development and applications. A rational basis for identification of individual areas of alternative energy sources for further research and development will be established. Active participation by authors and listeners should provide the direction and impetus for further research, development and policy formulations.

This volume of the proceedings presents the papers and lectures in a condensed format, grouped by subject matter under twenty-one chapters corresponding to the technical sessions. It is expected that this volume will serve as a concise reference covering the developments in the field of alternative energy sources.

T. Nejat Veziroğlu
Conference Chairperson & Editor

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New Delhi, India

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Orpheum

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P. Jawetz
Independent Consultant on
Policy
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Co-Chairperson:

G. Samuels
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Lyceum

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Florida International University
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Encore

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San Diego, California 92138, USA

Co-Chairperson: N. Camejo
Solar Electric Systems, Inc.
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Berkeley, California 94720, USA

Co-Chairperson: A. Z. Yilmaz
Istanbul Technical University
Taşkışla, Taksim, Istanbul, Turkey

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SESSION 2B: SOLAR APPLICATIONS — GENERAL I

Monday, 12 December 1983

1:30 p.m.-5:15 p.m.

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Illinois State University

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Pointe Claire, Quebec H9R 3J9, Canada

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