

Science Forum of the renewables2004

International Conference for Renewable Energies

Networked Knowledge for Renewable Energies

Research, Development and Education

– Basis for Wide-spread Deployment of Renewable Energies



Science Forum 2004

Organized by the Solar Energy Research Association

ForschungsVerbund Sonnenenergie (FVS)

On 1st June in Bonn

This publication has been supported by the BMBF

Inhalt

Science Forum 2004

- 5 Editorial: A Knowledgeable Strategy for the Dissemination of Renewable Energies
Jürgen Schmid, Sebastian Wienges, Gerd Stadermann • FVS (Germany)
- **Opening Introductory Notes**
- 9 The Significance of Research and Education for Renewable Energies
Wolf-Michael Catenhusen • State Secretary, German Federal Ministry of Education and Research (BMBF)
- 15 Science and Education as a Key to Development
Walter Rudolf Erdelen • UNESCO – United Nations Educational Scientific and Cultural Organization
- **Introductory Overviews: Research, Development and Education**
- 21 Global Research and Development on Renewables
Joachim Luther • GRA, FVS, Fraunhofer ISE
- 25 UNESCO's Global Renewable Energy Education and Training Programme (GREET Programme)
Osman Benchikh • UNESCO
- **Economic and Political Aspects of the Transition to Renewable Energy Systems**
- 41 Policies and Measures for Renewable Energy and Energy Efficiency in South Africa
Stanford A.J. Mwakasonda • Energy Research Centre (South Africa)
- 47 Research and Development Needs for Renewable Energy Technology in Industrialized Countries
Sigurd Wagner, Richard M. Swanson • Princeton University (USA)
- 51 The Challenge of Renewable Energies Integration in Energy Distribution Systems
Romeo Pacudan • UNEP Risoe Centre (Denmark)
- 55 Integrating Renewable Energy Into Society
Janice Hamrin • Center for Resource Solutions (USA)
- 61 Promotion of Renewable Energies for Heating and Cooling
Bernd Hirschl • Institute for Ecological Economy Research (Germany)
- 67 Transitioning to a Renewable Energy Future
Rian v. Staden • ISES (Germany)
- 73 Full Solar Supply of Industrialized Countries – The Example Japan
Harry Lehmann • Institute for Sustainable Solutions and Innovations (Germany)
- **Knowledge for Development: Capacity Building in Renewable Energies for Poverty Alleviation**
- 79 Research and Development Needs for Renewable Energies in Developing Countries
Mongameli Mehlwana • CSIR (South Africa)



FVS ForschungsVerbund
Sonnenenergie

Solar Energy Research Association

- 91 Capacity Building for Sustainable Energy Development and Poverty Alleviation in Sub-Saharan Africa
Stephen Karekezi, Waeni Kithyoma
• AFREPREN/FWD (Kenya)
- 99 Possible Cooperation between Arab and European Countries in Energy, Water and Environmental Issues
W. E. Alnaser • University of Bahrain
Gerhard Knies • Climate Protection Funds Hamburg (Germany)
Franz Trieb • DLR (Germany)
- 101 Capacity Building in Developing Countries – Bringing Renewable Energy to the People
Uwe Rehling • SESAM (Germany)
Henning Karcher • UNDP (Nepal)
Merina Pradhan • UNDP
- 107 UNESCO – Global Renewable Energy Education and Training Program in a Latinamerican View
Alfredo Curbelo Alonso
• Innovation and Energy (Cuba)
- **Launching the Open International Solar University (OPURE)**
- 115 The EUREC’s Master in Renewable Energies – Educating Renewable Energy Engineers
Didier Mayer • CENERG (France)
- 121 Renewable Energy Education Network: The International Institute for Renewable Energies (IIRE)
Wattanapong Rakwichian • SERT (Thailand)
- 125 European Network on Education and Training in Renewable Energy Sources
Spyros Kyritsis • EURONETRES (Greece)
- 129 Renewable Energy Research and Education Network
Jürgen Schmid • ISET (Germany)
- **Panel Discussion**
- 137 Opportunies and Necessities of Research and Education
Facilitator: Martha C. Lux-Steiner
• FVS, HMI (Germany)
- **Annex**
- 151 International Open University for Renewable Energies (OPURE)
- 153 International Organisations Concerned with Energy Issues
- 159 Press Conference
- 161 Press Release
- 165 List of Participants
- 175 Member Insitutes of the Solar Energy Research Association (FVS)
- 177 Photographic Credits
- 179 Imprint

Editorial: A Knowledgeable Strategy for the Dissemination of Renewable Energies

Energy was one of five foci of the World Summit on Sustainable Development (WSSD) in Johannesburg in 2002. While the access to modern energy is crucial for poverty reduction in particular and development in general, the way of producing and providing that energy is as crucial for environmental and social sustainability. Hence, the renewables2004 – the International Conference for Renewable Energies was the logical consequence and next step on the way forward. It was held from 1st June to 4th June 2004 in Bonn, Germany, and turned out to be a forum for stakeholders from all sectors: Governments as well as parliamentarians, the private sector, NGOs, International Organisations, and International Financial Institutions. On 1st June this multisectoral approach to the dissemination of renewables was completed by the Science Forum – Education, Research, and Training: Basis for Wide-spread Deployment of Renewable Energies. This one-day side-event brought together scientists and practitioners from all over the world, discussing the future requirements of research and development as well as needs and potentials of education and training for renewables in developing and industrialized countries.

Knowledge will be beyond doubt the source of power and wealth in the coming global knowledge-based society and, hence, is a leverage for all capacity building in sustainable development. The generation and distribution of knowledge, however, will not work the ways usual commodities do. Its value can hardly be priced, nevertheless it has value for actors in developmental processes. Knowledge can be characterized as public or at least semi-public good. Neither markets nor politics alone will be sufficient to provide the knowledge resources needed for the successful creation of markets for renewable energies.

Multisectoral partnerships of autonomous actors, who cooperate flexibly and provide each other with abilities, information, and complementary resources when needed, offer a new and increasingly prominent informally structured model for international cooperation for sustainable development. Knowledge networks combine efficiency of competition with effectiveness of cooperation. Those networks avoid situations of international stalemate and offer optimal conditions for the cooperative dissemination of renewable energies. One of the major, but not uncontroversial outcomes of the WSSD were the so called Type II partnerships, in all of which knowledge is an important resource to be traded.

Those organisational forms demand a strategy of management of knowledge in particular and of knowledge networks in general. That strategy has to complement self-organizing processes of markets with the mechanisms of political governance. It needs to connect decision-making to action and allow renewable energies through political interventions to compete on level playing fields.

The Science Forum achieved to gather the scientific community and contributed to the exchange and elaboration of strategic knowledge, though a consistent strategy to manage networks and their knowledge resources for the dissemination of renewables is (still) missing.

The Science Forum would not have been possible without the generous sponsorship and support of the German Federal Ministry for Education and Research (BMBF). We are also deeply grateful to the Thematic Advisor of the Conference Renewables 2004, Dieter Uh, of the German Energy Agency (DENA), and Martin Schöpe of the Federal Ministry for the Environ-



Jürgen Schmid

Solar Energy Research
Association (FVS/ISET)
jschmid@iset.uni-kassel.de



Sebastian Wienges

Solar Energy Research
Association (FVS)
wienges@gmx.de



Gerd Stadermann

Solar Energy Research
Association (FVS)
fvs@hmi.de

ment (BMU) for the thorough discussions and useful advice on the organisation. Special thanks deserve Hans-Josef Fell, MoP, who as parliamentary expert for research policy of Alliance 90/The Greens propelled the decision for the realisation of the Science Forum. This volume presents the papers of the speakers at the Science Forum, complementing each other to make knowledgeable the strategic significance of knowledge, respectively research and education for sustainable development and the switch to a renewable energy system. It cannot give a recipe how to manage that switch, that puzzle is still to be resolved, even if the organisers of the Science Forum hope to have made another step on "the way forward on renewable energy".

Particularly one outcome (see annex) of the Science Forum proves this hope to be realistic. During the panel discussion the proposal of an open international university for renewable energies was taken up and launched: On 2nd June, EUROSOLAR and the Solar Energy Research Association (FVS) initiated a foundation process of the Open University for Renewable Energies (OPURE), which was acknowledged as significant commitment and included in the International Action Plan of the conference. For the time being the university will be internet-based. A respective platform will be developed by the member institutes of the FVS. OPURE is supposed to serve the exchange of information and impart knowledge on renewable energies, connect existing initiatives and multiply the impact. The UNESCO, continuing the GREET Programme, and the BMBF welcomed the proposal and plan to finance that initiative.

OPURE opens a new opportunity to disseminate R&D results, information, and knowledge, and to make them accessible on a global scale. For environmental problems and knowledge have one thing in common: they do not stop at national borders. The renewable energy technologies are already forthcoming in the industrialised countries, but they cannot resolve the global environmental problems and mitigate climate change without the developing countries.