

ACQUAVIVA

Apresentador	MARTINS, FERNANDO
Tema	Mudanças Globais e Impactos na Energia e no Gerenciamento da Água
Título	SOLAR AND WIND ENERGY RESOURCES AND IMPLICATIONS ON GLOBAL CHANGE.
Informações sobre a autoria	Fernando Martins ¹ , Enio B. Pereira ¹ , Sylvio L. M. Neto ¹ , Samuel L. Abreu ² , Tom Hamlin ³ 1-CPTEC/INPE 2-LABSOLAR/UFSC 3-UNEP
Resumo	<p>The human development is strongly related with the per capita consumption of energy and, as a consequence of improvement of the life quality in the developing countries, it is expected an annual growth of the energy demand around 4% in those countries. The third IPCC report confirmed that the Earth's climate is changing mainly as a result of energy-demanding human activities, mainly from fossil fuel energy usage. The increase in energy demand, the reduction of the supply of conventional fuels caused by political crises in producing areas, and the growing concern with the preservation of the environment lead to the necessity of a sound survey for alternative energy resources. The renewable energy sources should be inserted into the energy matrix globally to reverse the increasing trend of worldwide greenhouse gas emissions to the atmosphere. The mid and long-range energy planning require reliable information on many natural resources focusing the renewable energy policy. Besides technological and price barriers, lack of information is an important obstacle to their insertion into the energy matrix in most developing countries. Information barrier includes: the lack of reliable assessment of renewable energy resource potentials and of long time series of ground data with adequate space distribution for studies of uncertainties and time trends; the limited knowledge of the variability and confidence levels linked to several natural and non-natural variables such as climate, topography and man-made impacts in environment; and the need for geographically-integrated database. Several studies were developed in Brazil to provide reliable data for the assessment of wind and solar energy resources. Despite these efforts, there is a need to compile all the contributions, altogether dispersed, into a single readily accessible database, along with other important information necessary to provide a valuable tool to develop new solar and wind energy projects in Brazil. The use of solar and wind energy will lead to several benefits in the long term by bringing the electricity to settlements located in remote areas like in the Amazon region, regulating energy production during dry season, and reducing the fossil fuels dependence and emission of greenhouse gases to the atmosphere. Currently, the CPTEC/INPE is coordinating two projects which aim at providing a consistent and easily accessible climatic and renewable energy database to overcome the information</p>



barriers and to foster the insertion of renewable energies on the Brazilian energy matrix.

The SWERA is a multinational project financed by UNEP and GEF. Its main objective is

to

provide a set of consistent, reliable, and accessible data sets for international and in-country investors and other stakeholders such as government agencies in order to

increase capacity for developing solar and wind energy plans and investments on the local,

national, and regional levels. A GIS toolkit has been developed to put together and cross-correlate data from energy resources, socio-economic, and infrastructure information

for the Brazilian territory. The GIS toolkit helps the study and delineation of possible scenarios for solar and wind energy utilization to evaluate the benefits and to retrieve

useful information for devising incentive policies for their insertion into our energy matrix.

The SONDA project aims at providing the country with high quality and reliable measurement

network to deliver ground-truth data for validation of satellite-derived models employed

in the assessment of solar and wind energy. The CPTEC/INPE devised the project to help the

government in supporting and evaluating the multiple actions of renewable energy resources

assessments in Brazil, such as that of SWERA. The ground measurements database generated

by whole SONDA network will be archived following specific procedures established by WMO

to provide control quality and reliability.

All information generated by both projects will produce a complete image of the solar

and

wind energy resources and will allow for a better understanding on how renewable energy

and climate are related to each other in Brazil. This work aims at presenting and

disseminating the first results of both projects. The GIS toolkit and ground-data

generated in both projects will be presented and discussed in order to illustrate the benefits and applications of solar and wind energy in Brazil.

References

Goldemberg, J., 1998. Energia, meio ambiente e desenvolvimento. São Paulo: EDUSP, Brazil.

IPCC, 2001. Climate Change 2001. United Nations Intergovernmental Panel in Climate Change.

Cambridge University Press, UK. (available from www.ipcc.ch).

SWERA website. [online] www.cptec.inpe.br/swera, 2004.

SONDA website. [online] www.cptec.inpe.br/sonda, 2004.