



Satellite-derived solar resource maps for Brazil –SWERA project

F. R. Martins (1), E. B. Pereira (1), S. L. Abreu (2), S. Colle (2), D. Renné (3), R. Perez (4) and T. Hamlin (5)

(1) Center of Weather Forecast and Climatic Studies, Brazilian Institute of Space Research, Brazil, (2) Solar Energy Laboratory, University of Santa Catarina, Brazil, (3) National Renewable Energy Laboratory, USA, (4) Atmospheric Sciences Research Center/State University of New York, USA, (5) UNEP/DTIE, France (fernando@dge.inpe.br / Fax: +55 12 39456666)

The increase in energy demand, the high price of fossil fuels caused by political crises in producing areas, and the concern with the environmental protection are stimulating the scientific survey for alternative energy resources. Furthermore, an effort to reduce and reverse the growth of global emission of greenhouse gases will, among other things, require the large-scale development and employ of technology for sustainable use of renewable energy sources.

The lack of reliable and easily usable data of energy resources is the primary obstacle for investments of the public and private sectors in large-scale applications of renewable energy sources in most of the developing world. For many developing countries, such reliable and sufficiently detailed data are non-existent yet. Besides that, another obstacle is the lack of tools to evaluate these scarce data with the objective of energy planning and introducing these renewable energy sources into the energy matrixes of developing countries.

SWERA (Solar and Wind Energy Resource Assessment) is a project financed by United Nations Environment Programme (UNEP), with co-financing by GEF in the area of renewable energies, more specifically, solar and wind energy. The project is assembling high quality information on solar and wind energy resources into consistent GIS (Geographic Information System) analysis tools. The project is aimed at the public and private sectors involved in the development of the energy market and it shall enable policy makers to assess the technical, economic, and environmental potential

for large-scale investments in renewable and sustainable technologies.

The SWERA project is now at the stage of formatting information, validating of energy resource models, and GIS data processing. The Brazilian Institute for Space Research (INPE) and Solar Energy Laboratory (LABSOLAR) are working together to produce solar energy resource maps for Brazil and South America using the radiative transfer model BRASIL-SR. This paper presents the methodology developed to produce the solar maps and discuss the outcomes of SWERA project. A GIS tool is being developed to evaluate, to compare and to overlap the solar energy resources maps with all sort of socio-economic information like population distribution, per capita income, maps of railroads, rivers, roads, distribution lines of electricity, industry locations, power plants (nuclear, hydroelectric and others), etc. Future scenarios will be evaluated using the GIS tool in order to reveal the benefits of employment of solar energy in Brazilian energy matrix. More detailed information about SWERA project in Latin America can be accessed in the website <http://www.cptec.inpe.br/swera>.