

NASA Satellite Measurements and Modeling Contributions to Decision Support in the Energy Sector

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Abstract:

The Prediction of Worldwide Energy Resource (POWER) project, conducted at the NASA Langley Research Center, seeks to expand the use of global weather and solar energy information in energy-related industries by interacting with partners to benchmark NASA research data sets derived from the analysis of historical and current observations. Four of these industries have been identified and targeted for use of NASA analysis and modeling data:

- * Renewable Energy Production: assist energy producers in locating optimum sites for Renewable Energy Technologies (RETs).
- * Building Design: assist architects and engineers in understanding the seasonal environment a building must endure and design to optimize energy usage.
- * Biomass Fuel Development: assist farmers in planning, monitoring, and predicting yield of various fuel crops.
- * Energy Utilities: assist utility companies in the decision-making of buying and selling power.

The POWER project contribution consists of developing pathways of environmental information that assist designers and planners to develop decision support systems (DSS) which are optimized for their local weather and climate conditions and to assist planners and managers in the maintenance and operation of these systems. These elements are specifically identified in both the Climate Change Science and Technology Programs' (CCSP/CCTP) strategic plans and contribute to the priorities of the United States Group on Earth Observations, the Global Earth Observation System of Systems, and the G8 Gleneagles Plan of Action on Climate Change, Clean Energy and Sustainable Development.

The POWER project uses the NASA Surface Solar Energy (SSE) data set and adds near-real time and forecasted datasets to the historical datasets. The project has developed prototype pathways to deliver data important to renewable energy system design in partnership with Natural Resources Canada's renewable energy DSS, RETScreen, the National Renewable Energy Laboratory's Hybrid Optimization Model for Electric Renewables (HOMER) DSS, and the photovoltaic sizing tool, SolarSizer, maintained by SoL Energy. These activities have also contributed to the United Nations Environment Programme (UNEP) Solar and Wind Energy Resource Assessment (SWERA). SWERA provides solar and wind resource data and geographic information assessment tools to the public and private sectors in 13 developing countries.

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