Jean Ku, NREL, PIX10703

Solar water heater systems on rooftops in Kunming, Yunnan Province, China.

How do I use renewable energy in my region?

NREL maps the answer

Energy planners, project developers, and policy makers use renewable energy technologies more effectively when they have accurate and thorough information about their renewable energy resources. NREL can assess these resources, integrate the resource information with other data using geographic information systems (GIS) and interface the data with key analytical models. Planners and energy developers use these integrated resource assessments to make decisions about the feasibility, cost-effectiveness, and risks of developing projects in specific locations, and for regional energy planning efforts – to provide electricity and to meet environmental and health goals.

1,000 MW of concentrating solar power is more than feasible in the Southwest United States.

Renewable Potential in the West

NREL works with universities and government agencies to assess resources and create maps of wind and solar potential across the United States. For the Bureau of Land Management (BLM), NREL analyzed the potential for wind development in 11 western states, triggering significant interest in developing wind projects on western public lands. The analysis was used to develop a Wind Energy Development Policy and a multi-state Wind Programmatic Environmental Impact Statement that streamlines the approval process for new wind projects.

NREL also worked with the State University of New York (SUNY) in Albany, to respond to a Congressional initiative to develop 1,000 MW of concentrating solar power (CSP), to supply electricity to the southwestern U.S.. Combining satellite data with GIS data, they quantified the potential for large-scale CSP generation, showing that 1,000 MW is feasible, even conservative, and showing the optimal locations

Geospatial Toolkit (GsT)

The GsT allows the user to combine wind and solar resource data with local geographic and infrastructure information. This information is needed to support energy planning and policy development. It lowers risk for project developers and reduces project lead times. For example, the toolkit calculates the amount of solar/wind resource that occurs within specific distances of transmission lines or roads. Layers of data display, allowing users to visualize the results.

The GsT is easy to use. No GIS expertise or software is required. It can help developers and planners understand the renewable energy resources and potential for the area included, help users choose optimal candidate sites for RE applications, and support energy planning.

GsTs for Bangladesh, Brazil, El Salvador, Ghana, Guatemala, Honduras, Oaxaca, Nicaragua, Sri Lanka and other countries are currently available for download from the NREL Web site: ***www.nrel.gov/international/geospatial_toolkits.html***

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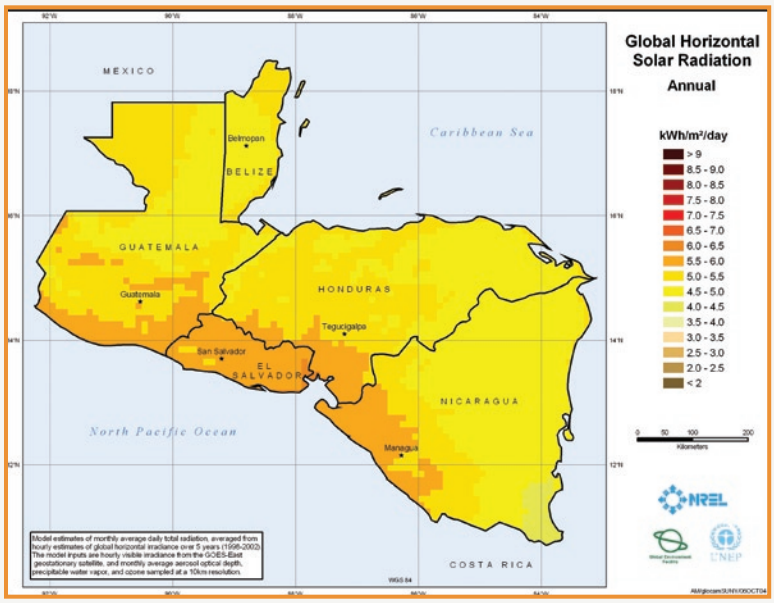
for development. Subsequently, the Western Governors Association (WGA) adopted a resolution that calls for 30,000 MW of clean, diversified energy in the western U.S. by 2015.



Incorporating annual and seasonal solar resource data facilitates more accurate sizing and lower costs for PV projects.

the Sri Lanka GsT directly to the HOMER model. HOMER software allows the user to analyze a variety of system options in order to determine the best off-grid or on-grid configurations for a given set of circumstances. By integrating renewable energy resource information, GIS data, and system configuration options, NREL can help the decision maker decide how to meet specific needs, and the pros and cons of different approaches.

Under SARI/E, NREL has enhanced these models to include resource information for other technologies, such as microhydro. NREL is currently working with SARI/E to provide services and products to Afghanistan and Pakistan. Products can be found on NREL's International Programs Web site: ***www.nrel.gov/international/rr_assessment.html.*** HOMER may be downloaded for free at: ***www.nrel.gov/homer/.***

International Renewable Energy Development

NREL works with countries throughout Asia, Latin America and Africa that are interested in considering additional renewable energy in their energy mix. NREL works with partners in each country to assess their resources and consults with policy makers and project developers. Some regions have little or no access to the grid. Renewable energy can bring electricity to these areas, along with related benefits such as local economic improvement, increased literacy and improved health. The impact of renewable energy projects is greater as population increases and as climate change and air pollution worsen. NREL's resource assessment information is especially helpful to developing countries that do not have the resources to track and map this information.

Case Study: Sri Lanka & the Maldives

NREL collaborated with the United States Agency for International Development's (USAID) South Asia Regional Initiative for Energy Cooperation and Development (SARI/E) and with country partners to develop solar and wind resource maps and data for Sri Lanka and the Maldives. Overlaying resource data with transmission data, load centers, roads, protected areas, etc., NREL enabled the Sri Lankans to visualize the relationship between their resources and infrastructure. NREL took integrated resource assessment to another level by interfacing

Latin America

Working with the United Nation's Environment Programme's Solar and Wind Energy Resource Assessment (SWERA) project, USAID, and country partners, NREL has provided planners in Central America and Mexico with information on their potential resources. This included identifying the best sites for renewable energy projects, training local experts to perform pre-feasibility studies, and providing solar maps for different times of the year to size PV systems more cost-effectively. The detailed information helps project developers to obtain project funding and launch successful projects.

In Nicaragua, the National Assembly used NREL's SWERA wind maps to support the approval of a Decree on Promotion of Wind Energy in 2004. Wind maps helped Nicaragua find financing for feasibility studies on integrating large wind into the grid, and solar maps were used as basis for a project of 6000 rural PV systems. In Guatemala, wind maps are being used in the development of more than 400 MW of wind generation. In Honduras, solar maps are supporting new rural PV projects and the GsT is being used for country-wide renewable energy planning. In Mexico, NREL's resource mapping and Oaxaca GsT are contributing to the planned development of 2,000 MW of renewable energy in Oaxaca by 2015.

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Additional Resources

www.nrel.gov/international/rr_assessment.html

SWERA: http://swera.unep.net/swera/index.php

SARI/E: www.sari-energy.org

HOMER: www.nrel.gov.homer

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