

Introduction



The Renewable Energy Atlas of the West is designed as a resource for policy makers, advocates, landowners, developers and others interested in furthering the production of electricity from renewable wind, solar, geothermal and biomass energy resources.

Purpose

Utilizing state-of-the-art GIS technology, the Atlas brings together the best existing renewable resource maps and data into a single comprehensive, publicly available document and interactive Web site. It does not provide a new regional assessment of renewable resources, but rather shows the current understanding of these resources throughout the West and highlights the issues affecting their development. In addition, it identifies areas where new data are needed in order to more accurately represent the region's renewable energy resources.

While the maps contained in this Atlas do not eliminate the need for on-site resource measurement, they can help developers gain a better understanding of where the best renewable resource areas are found and screen out the less promising areas. This can significantly minimize the cost and time involved in prospecting. Landowners can use the information for a first-cut feasibility analysis of using renewable resources to supply electrical power to their homes, farms, ranches and businesses, while policymakers will find it a useful tool for broader planning purposes.

Summary

The Atlas begins with an overview of regional maps of the wind, solar, biomass and geothermal resources. The second section describes the current status of renewable energy development, including a summary of the region's current electricity supply mix and a map of the locations and installed capacity of existing renewable energy facilities. A regional map shows state-level policies, including tax incentives, system benefits charges and portfolio standards, which have been implemented in several states to stimulate the development of renewable energy. The final section in the overview addresses important issues to consider in developing new renewable energy

projects, including transmission capacity, load growth, land use and environmental impacts.

The Atlas continues with individual sections for each of the eleven Western states: Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington and Wyoming. Each state section features success stories of renewable energy development, state-level maps of wind, solar, biomass and geothermal resources and summaries of existing policies, installed renewable energy facilities and the current electricity supply mix. The final sections of the Atlas include a glossary, a technical notes section, and a list of resources for further information.

Why Renewable Energy Development is Important for the Region

The Western US is home to five of the ten fastest growing states in the country. This growth will greatly increase demand for electricity across the region over the next decade. Renewable resources

can play an important role in helping to meet this demand. They provide clean, low-risk power that, over the long term, can lower the region's electricity costs.

Developing the region's vast renewable resources can provide:

Environmental Benefits	Economic Benefits	Security Benefits
<ul style="list-style-type: none"> ▪ a cleaner environment ▪ better air quality ▪ improved public health ▪ reduced water usage for electricity generation 	<ul style="list-style-type: none"> ▪ economic opportunity ▪ rural economic development ▪ risk management ▪ fuel price stability ▪ lower costs over the long term 	<ul style="list-style-type: none"> ▪ energy independence ▪ system diversification and reliability

Future Research Needs

Several areas requiring further research, including basic resource assessments, refined power production potential estimates and data on transmission constraints, have been identified.

Fundamental assessments for wind, solar, biomass and geothermal resources are critical for planning purposes. New high-resolution wind power maps for Arizona, California, Colorado, New Mexico, Nevada and Utah are scheduled for completion by 2003. These new maps will more accurately portray windy lands in each state, and can provide important data of seasonal and diurnal patterns for comparison to load profiles and transmission availability. Efforts are also underway to map solar radiation data in greater detail, which can assist in evaluating solar potential in shaving peak demand. Geothermal resource estimates are particularly difficult, as test drilling is generally required to determine whether a location is suitable for power production. However, a better

understanding of geothermal modeling techniques could assist planners. Finally, improved biomass resource estimates would be helpful, particularly for Nevada, and updates of available wood wastes and forest residues may be needed.

For solar, biomass and geothermal, power production estimates hinge on many unknown components, including future cost reductions and technology innovations that will make these resources more competitive.

Transmission constraints represent a significant barrier to large-scale renewable resource development, however renewables also stand to contribute greatly in the shift to increased reliance on distributed generation near loads. Information on the location and severity of transmission constraints and their relationship to geographic and temporal characteristics of the region's renewable resources will help in integrating these resources into the regional power grid.

