



GeoPowering the West

Getting Organized in the Public Sector to Promote U.S. Geothermal Development

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“This is the first geothermal get-together that we’ve had in this state in over a decade....”

That has been a common statement at GeoPowering the West (GPW) meetings across many western states during the past three years. Since its beginning in January 2000, the GPW initiative has been working to organize groups and individuals with geothermal interests into state working groups throughout the West. While California and Nevada are the leaders in geothermal power production and infrastructure, the geothermal development ambitions of other western states are now benefiting from interactions with GPW.

During a Washington, D.C. ceremony in January 2000, Sen. Harry Reid (D-NV) helped the U.S. Department of Energy (DOE) announce the kickoff of the GPW geothermal technology outreach effort. The initiative is a public-private partnership with the goal of bringing geothermal heat and power to millions of homes and businesses across the West. GPW objectives are twofold:

- Broaden an existing and successful outreach and education program to engage electric utilities, state regulatory agencies, and others to bring together local and state stakeholders, suppliers, users, and environmental groups; and
- Provide project financing and geothermal leasing information to potential developers, entrepreneurs, and small businesses.

GPW resides in the deployment arena of the DOE Geothermal Technologies Program. It is designed and implemented to complement the research and development activities conducted by the agency and its national laboratories. GPW partners with organizations from both the private and public sectors. The focus is on capturing the economic, environmental and energy security benefits from developing our nation’s abundant geothermal resources, and providing this information to relevant decision-makers.

GPW Challenges

Geothermal electricity is viewed as being generally more expensive than other options. This impacts development, even though rising fossil



The U.S. Department of Energy GeoPowering the West program seeks to increase geothermal power operations and direct-use applications in the United States. Development of geothermal resources present a number of challenges, including exploration and construction in remote areas across the region. Pictured is ORMAT’s Desert Peak power plant in northern Nevada.



TIC/GRC

In April 2002, the Geothermal Resources Council convened an Introduction to Geothermal Energy Workshop at the University of Nevada, Reno for the U.S. Department of Energy GeoPowering the West program. The two-day event was attended by 65 participants from the government and private sectors, as well as Native American Tribes.

fuel prices may create new opportunities. Geothermal development projects are dependent upon obtaining accurate information about the geothermal resource. In some cases, geothermal development may stimulate environmental concerns, despite its modest impact to the land and negligible air emissions and water pollutants.

For any energy project there are always some risks, challenges and barriers. These include need for generation, public attitudes, regulations and constraints, integration with existing infrastructure, and environmental considerations. For geothermal projects, these challenges or barriers often result in repeated obstacles to development at various levels of decision-making. Barriers also include siting and permitting delays, transmission limitations and Native American concerns. These issues may contribute to increased transactional costs for geothermal development.

GPW's primary challenge is to overcome these barriers by raising public awareness, accurately conveying the benefits of geothermal development, and decreasing risks to investors.

GPW Approach to Education, Outreach, And Institutional Barriers

Geothermal energy has many advantages over traditional extractive resources, including its relatively minimal environmental and operational impacts. It supplies high-capacity factor (baseload) energy, provides diversification as a regional alternative to fossil-fuel power plants, and reduces emissions of greenhouse gases. However, geothermal technologies often lag behind other technologies in public perception and support. GPW is organized around four common-interest networks, including:

State-Level Support and Outreach. The creation of state working groups, using local and regional stakeholders, fosters cooperation and sensitivity to state and local issues and needs. To date, this effort has shown considerable promise, and has broadened awareness about geothermal potential across the western United States. Development of detailed and current geothermal resource maps and educational workshops with state- and local-level policymakers are examples of

fruitful activities in this area. DOE's Geothermal Technologies Program is assisted by three primary national laboratories: the National Renewable Energy Laboratory (Golden, CO), the Idaho National Engineering & Environmental Laboratory (Twin Falls, ID), and Sandia National Laboratories (Albuquerque, NM). In addition, the DOE Denver and Seattle Regional Offices play critical roles in moving GPW forward. All of these agencies provide considerable outreach and technical assistance services for GPW states.

Industry and Stakeholder Partnerships. The creation of mutually beneficial partnerships that include public power and investor-owned utilities and rural electric cooperatives simply makes sense given GPW objectives. Landowners, regulators, environmental groups, and industry partners can form an effective partnership to overcome barriers to appropriate use

of geothermal energy. Partners include the Geothermal Resources Council (GRC - Davis, CA), Geothermal Energy Association (GEA - Washington, DC), Oregon Institute of Technology Geo-Heat Center (Klamath Falls, OR), Geothermal Education Office (GEO - Tiburon, CA), Washington State University (Olympia, WA), University of Nevada-Reno Great Basin Center for Geothermal Energy, National Council of State Legislatures (Denver, CO), National Geothermal Collaborative (NGC - administered by Resolve, Inc. - Washington, DC), and Bob Lawrence & Associates, Inc. (Alexandria, VA).

Federal Partnerships. Expanded use of geothermal energy resources on federal lands and use of power marketing agencies (including the Western Area Power Administration [WAPA]) and regional DOE offices can greatly extend the reach and influence of GPW. We find that in many western states, there is a considerable desire to know more about geothermal resources, technologies, and potential, coupled with the need to identify promising "local" solutions to energy and power needs.

Native American/Tribal Support. Vast geothermal resource potential coupled with the need for local control and empowerment is an enticing combination for Native Americans. Tribal agencies and groups can benefit substantially from responsible and equitable development of geothermal resources, not only for power generation but for direct utilization as well. Careful, respectful, culturally sensitive interactions with tribal authorities and agencies is the first step toward sensible development and use of their indigenous geothermal resources.

DOE State Energy Program and GPW

The DOE Denver and Seattle regional offices have funded State Energy Program (SEP) geothermal projects over the last several years. The objective is to establish noteworthy projects that will encourage, educate, and persuade state and private officials to incorporate geothermal energy into their renewable energy portfolio. The following SEP awards represent significant support to the states:

- 2001 Nevada Geothermal Resources Database and Website
- 2001 Idaho Geothermal Resource Assessments
- 2001 Prioritization of Utah's High Temperature Geothermal Resource Potential
- 2002 Alaska State Geothermal Energy Support
- 2002 Idaho Geothermal Energy Development
- 2002 New Mexico Geothermal Clearinghouse
- 2002 Promoting Direct Use Development of Utah's Geothermal Resources
- 2003 Arizona Geothermal Collaborative Outreach Program
- 2003 Assessment of Hawaii's Geothermal Resource and Potential for Hydrogen Production
- 2003 Geothermal Energy Outreach in Rural Idaho Communities
- 2003 Identifying New Opportunities for Direct-Use Geothermal Development (CA)
- 2003 New Mexico Geothermal Direct-Use Development

GPW Success Stories

Alaska. With the award of a SEP grant, efforts have begun to identify the potential of geothermal use in Alaska through contact with U.S. Sen. Lisa Murkowski (R) and state energy officials. An Alaska "trade mission" (modeled after the successful Idaho-to-Nevada trade mission) to Nevada is scheduled for this year.

Arizona. A state working group has been formed and documentation related to past geothermal investigations has been made more accessible to state partners and stakeholders. In an effort to reverse the lack of visibility of geothermal in past years, industry members, a utility, and the GPW program asked the Arizona Corporation Commission to allow geothermal energy to be included as a qualified renewable energy source (as a prerequisite to a power project) under the state's Renewable Portfolio Standard. The action was successfully allowed under a variance.

California. GPW efforts have begun in California with interactions at the California Energy Commission (CEC). GPW has supported industry involvement with California's Renewable Portfolio Standard (RPS) rulemaking, and a study of renewable energy availability and high-voltage DC transmission line access to the Southern California grid. This effort was made in cooperation with the geothermal industry and funded by the CEC. Results will be reported in 2004.

Hawaii. A geothermal meeting was convened in Hawaii in January 2004 to assemble stakeholders for renewed discussions. Approximately 40 participants attended the meeting, including representatives from Hawaii's Department of Business, Economic Development and Tourism, Department of Land and Natural Resources, Department of Health, Maui and Hawaii counties, the University of Hawaii, Hawaii

Electric Co., Puna Geothermal Venture, DOE and its national laboratories, and consultants. Because additional geothermal production in Hawaii is not universally welcomed, the upshot of the meeting was that local stakeholders should take charge of future geothermal development considerations. It should be noted that in the spring of 2004, Renewable Hawaii, solicited renewable energy (wind excluded) project proposals that offer opportunities for potential investment in cost-effective and operationally positive renewable energy projects on the Big Island of Hawaii.

Idaho. Geothermal interest in Idaho has flourished with GPW support. It has formed a state working group, developed a strategic plan, identified high potential projects, and raised visibility by hosting a GPW conference with Sen. Larry Craig (R). The Idaho State Working Group also participated in a trade mission to Nevada, where geothermal applications and benefits were highlighted for Idaho representatives and policymakers. Two geothermal power projects have recently now been announced in southern Idaho, at Raft River and Willow Creek.

Nevada. High-level political attention for geothermal development in Nevada continued with two GPW conferences attended by Sen. Reid. Concurrently, GPW supported formation of the Nevada State Working Group and various activities, including a well-attended *Introduction to Geothermal Energy Geothermal Workshop* convened by the GRC. GPW also hosted the previously mentioned Idaho State Working Group trade mission and participated in the California transmission line study (aggregation of generation resources in Nevada). Site investigations near Reno were also performed for the Pyramid Lake Paiute Tribe, which has received federal funding for geothermal development on its lands. About 100 megawatts of potential new geothermal power generation projects have recently been announced in Nevada.

New Mexico. U.S. Sen. Jeff Bingaman (D-NM) spoke at a recent statewide conference that raised geothermal visibility in the region. GPW efforts also supported the state's Renewable Portfolio Standard, which creates a market for geothermal and other renewable alternatives by mandating that investor-owned utili-

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ties procure at least 5 percent of their supply from renewable resources by 2006, and 10 percent by the year 2011. Through a WAPA Request for Information, federal institutions in New Mexico (Sandia National Laboratories, Los Alamos National Laboratory, Kirtland Air Force Base, and DOE) have sought to procure renewable energy for their installations. Efforts to support tribal use of geothermal energy have been ongoing, with the most notable effort at Jemez Pueblo.

Oregon. In July 2003, GPW, the U.S. Bureau of Land Management and the Oregon Department of Energy hosted an Oregon Geothermal Collaborative meeting, giving wings to the Oregon State Working Group. The event sparked new interest in the role that geothermal can play in supplying Pacific Northwest utilities with renewable energy. The OIT Geo-Heat Center, WSU Energy Program, GEO and GRC were key players in staging the meeting and companion workshop and field trips.

Utah. Utah has formed a state working group, has convened several meetings and prioritized geothermal areas for development. A CD-ROM has been developed in support of geothermal education in the state. PacifiCorp is working with ORMAT International, Inc. (Sparks, NV) to add a bottom-cycle (binary) power unit downstream from the main Blundell geothermal power plant at Roosevelt Hot Springs near Milford.

Washington. In November 2003, GPW convened its first meeting at another Pacific Northwest state, Washington. The Washington meeting was well attended by industry and utilities. The Columbia Gorge region and the Cascades mountain range were identified as key geothermal resource areas. The Columbia Basin area was identified for direct-use opportunities.

Other GPW Accomplishments

GPW remains active in the public arena. Topical reports have been produced by NREL, including the *Geothermal Facility Siting Issues Workshop Report*, *Assessing the Potential for Renewable Energy on Public Lands*, and *Opportunities for Near-Term Geothermal Development on Public Lands in the Western United States*. Bob Lawrence & Associates have produced the *Geothermal Small Business Workbook* and the *Geothermal Money Book*. The NGC has published *Evaluating State Renewable Portfolio Standards: A Focus on Geothermal Energy*.

The creation of detailed, current geothermal resource maps is one of the most important products needed to support development of the technology in the western states. Through GPW, INEEL has produced geothermal maps for all of the western states (available on the Internet at: <http://geothermal.id.doe.gov/maps-software.shtml>).

Future Opportunities and Conclusions

Working in conjunction with the U.S. geothermal industry, power producers and suppliers, industrial consumers, residential end-users, and federal, state and local officials, GPW will continue to provide technical assistance, guidance, information, and limited, cost-shared funding to state-level activities to identify and develop geothermal energy resources. GPW will focus on projects and issues relevant to research and development in the DOE Geothermal Technologies Program. By demonstrating the benefits of geothermal energy, the program helps to make community, state and regional representatives aware of the opportunities to enhance local economies with geothermal energy development. By identifying barriers to development and making them known to those with the responsibility for eliminating them, GPW is helping policymakers take the first steps towards creating a more favorable regulatory and economic environment for geothermal power generation and direct-use applications. ■

For more information about the GeoPowering the West effort, contact **Roger Hill** by phone at: (505) 844-6111. Email: rrhill@sandia.gov. Sandia National Laboratories is a multiprogram laboratory operated by Sandia Corp., a Lockheed Martin company, for the U.S. Department of Energy under contract DE-AC04-94AL85000.

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